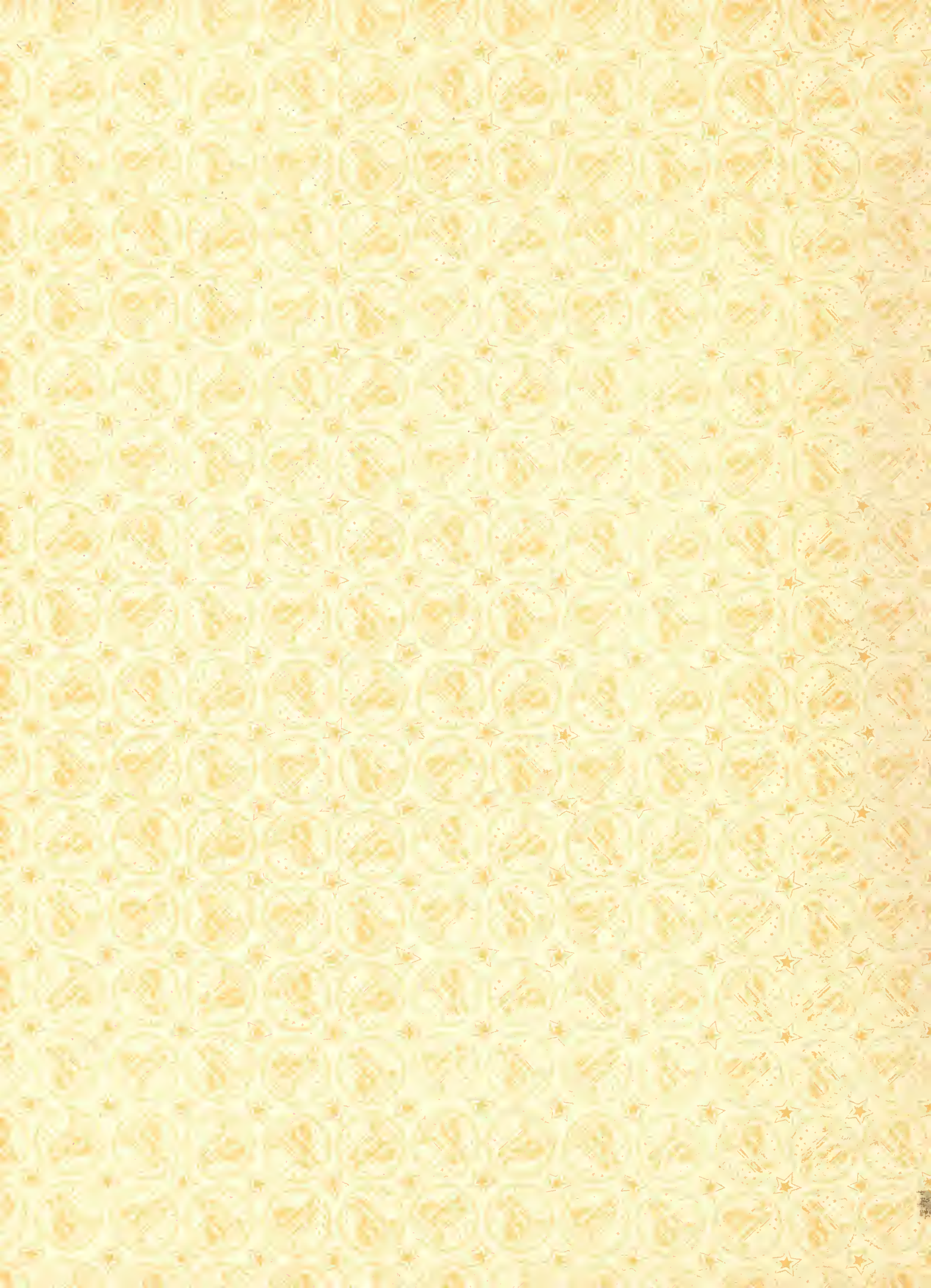


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Early Dawn

ELECTRIC VEHICLES

A MAGAZINE FOR THE ELECTRIC CAR OWNER. \$1.50 PER YEAR. 1253 MONADNOCK BLDG.

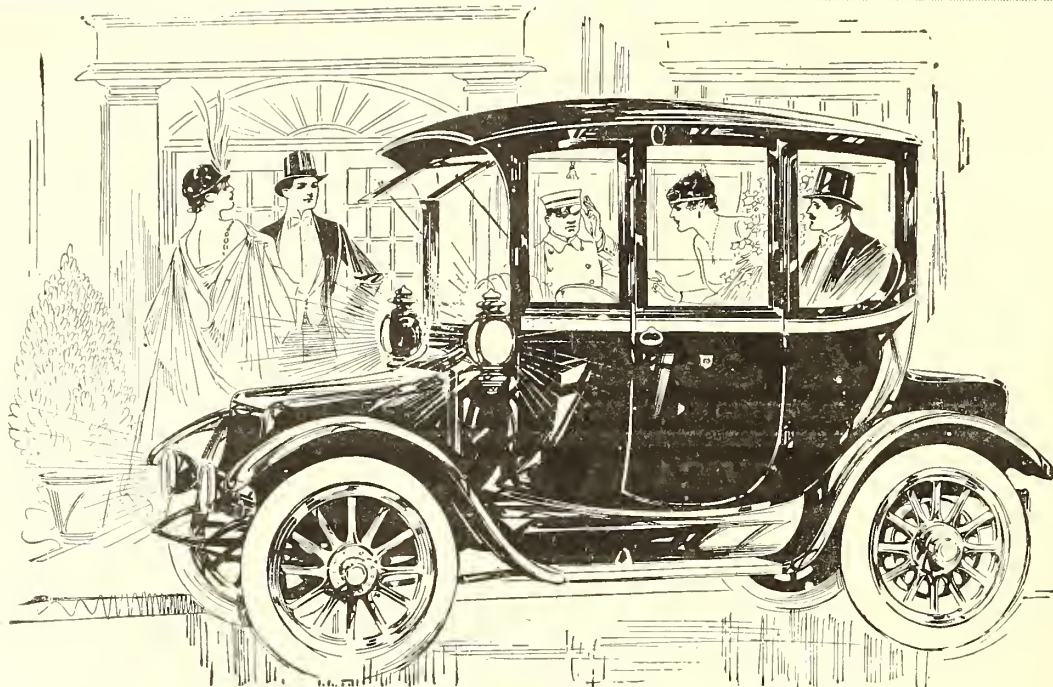
Vol. 7

CHICAGO, JULY, 1915

No. 1



1915 OHIO COUPE



Culture's Car

There is a distinct place in Car-dom which only the Electric Automobile can fill.

For those who live in town or suburbs it is the one logical car.

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our place
or your own

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Volume VII

CHICAGO, JULY, 1915

Number 1

A Visit to Mt. Vernon

Electric Vehicle Makes Tour to the Historic Homestead of Washington

MT. VERNON, Va., "The Home of Washington," was recently visited for the first time in the history of the electric vehicle by a Rauch and Lang electric brougham, driven by representatives of that make vehicle in the National Capitol. The trip was unique in many ways and the manner in which the horseless vehicle glided over the highways of the Old Dominion startled the natives in a manner, the like of which has not been witnessed in many years.

It has only been within the past year or two that even gas cars attempted to motor to this historic homestead, but since the recent completion of a new gravel highway from Alexandria, Va., to a point within a mile or two from Mt. Vernon, the motoring public has regained its lost courage and now in rapidly increasing numbers is paying homage to this great American patriot.

It was in the year 1674, by grant of Lord Culpeper, that a tract of some 5,000 acres situated on the west bank of the Potomac River, south of the present city of Washington, became the property of John Washington and Nicholas Spencer. Half of this tract descended to Lawrence Washington, who in 1743 built a residence, and named the estate Mount Vernon, after the British Admiral under whom he served. At Lawrence Washington's death, in 1752, the estate passed to the ownership of his half-brother, George Washington, who subsequently extended the boundaries of his plantation until they included nearly 8,000 acres.

It was for the purpose of visiting this mansion that Alfred Young, H. A. Hall, and the author as automobile editor of the *Washington Star*, the former two being the representatives of the Rauch and Lang electric

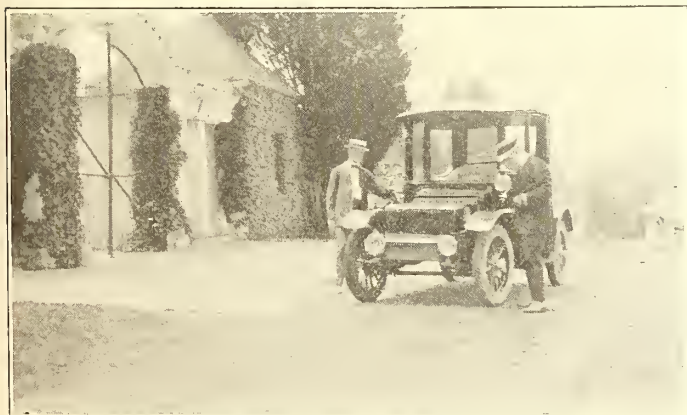
BY HOWARD S. FISK

sales staff in the National Capitol, elected to make the overland journey

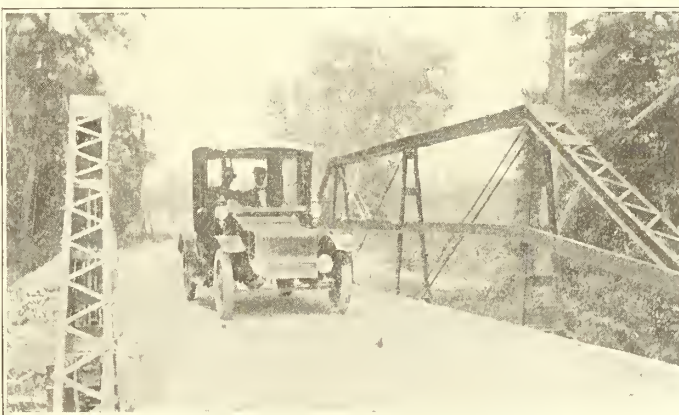
in true modern style by attempting to operate an electric to this place. The date of the trip was Wednesday, June 16, with perfect weather conditions prevailing. The trip was made without incident and the 18 miles made in slightly less than an hour and a half. The new highway carried the tourists within two miles of the main entrance to the grounds at Mt. Vernon. As no vehicles of any character are permitted within the grounds the electric brougham was parked on the outside of the grounds at the entrance.

A charge of twenty-five cents is made to enter the grounds and a more imposing site cannot be found throughout the entire United States. On inquiry we learned a little of the early history of the estate. We were told that in 1799, when George Washington died, the property passed as a life interest to his widow, by whose will most of the household effects in the mansion were, after her death, divided among her four grandchildren. Thus was the original furniture of Mount Vernon eventually scattered. Bushrod Washington, John Augustine Washington and John A. Washington, Jr., followed in succession as owners of Mount Vernon.

John A. Washington, Jr., the last named owner, in accordance with the wish of his family, to effect a permanent preservation of the property, offered to sell it to the national government. This project failed, as did likewise an attempt to sell it to the commonwealth of Virginia. At this juncture the Mount Vernon Ladies' Association of the Union in 1856 organized by Miss Ann Pamela Cunningham, of South Carolina. Her appeal to the patriotism of all American women resulted



Arriving at Mt. Vernon Gate.



Picturesque Roads Lead to the Homestead.

in the accomplishment of her noble project in spite of many obstacles. Few can appreciate the work that has been accomplished in order to retain the appearance of simplicity which characterized the home life of Washington, to preserve the reverence of his hallowed shrine



Washington Is Noted for Its Splendid Roads.

and at the same time meet the protective requirements incident to increasing wear and tear of the mansion and the historic relics contained therein.

After leaving Mount Vernon, the motoring party returned to the main highway and resumed their journey westward to the ancient village of Accotink, where the electric brougham proved equally of interest to the natives, who surrounded it and viewed with astonishment the type of machine which had wended its way this far into the Old Dominion, without the aid of horses. After a brief pause in this village the electric was sent spinning over the highway, rolling as it did through natural woodlands and forests, to the old time village of Pohick. It was at Pohick Church, just eight miles from Mount Vernon, that Washington and members of his household attended worship.

The parish church was built during the years 1768-70 from the plans drawn by General Washington, who was a member of the building committee. He was a vestryman of the parish for twenty years, and for the greater part of that time was a regular attendant at service, never permitting, as Bishop Meade says, "the weather or company to keep him from church." Subsequently Washington became connected with Christ Church, Alexandria, where today his family pew may be seen as he used it.

Pohick Church, during the Civil War, was occupied at times by Federal troops and all of the interior furnishings were destroyed. The church has been practically restored, as well as other appointments of the interior. The historic burying ground adjoins Pohick Church, which is still being used for burying the dead, who reside in that vicinity and own lots. The church is used every Sunday morning at 11 o'clock for service, to which the public is always admitted. Visitors, who desire, may have the church opened, by the payment of a small sum to the sexton of the edifice, who resides across the road. After a visit to the church, the electric was turned in the direction of home, which was reached about 4 o'clock in the afternoon. No trouble of any character developed, and as a result of this run the members of the fairer sex who own electric cars in the National Capital are expected to make frequent visits to Mount Vernon, now that the way has been paved and confidence displayed in the electric storage vehicle.

Waverley Holds Sociability Runs in Indianapolis

The electric sociability run is fast becoming an institution in Indianapolis and the Waverley Company is doing all possible to help the good work along.

The purpose of the company is, of course, educational, its idea being that Waverley owners, and for that matter owners of electrics of all makes, do not get as much use out of their cars as they should, owing to the prevalent feeling that electrics are designed for city streets only.

As a matter of fact, the new model electrics with their long wheel base and better springs are more comfortable on country roads than half the gas cars built especially for that service.

It is to impress this fact on Indianapolis owners of electric cars that the Waverley Company recently inaugurated a series of short sociability runs to near-by points of interest.

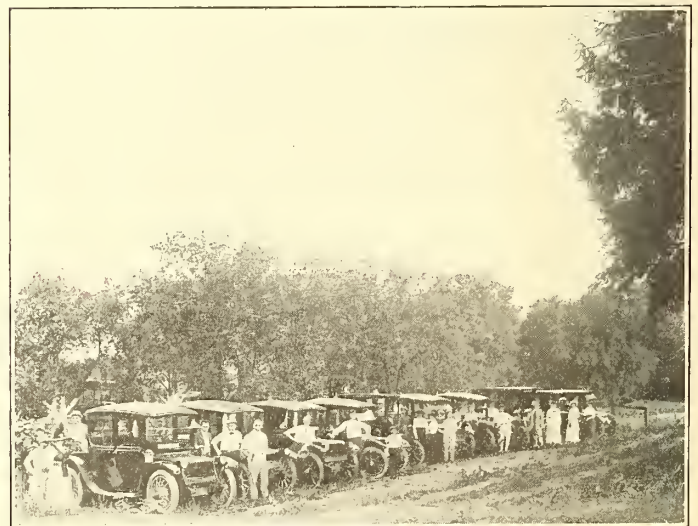
Eleven Waverley electrics driven by owners made one of these trips into the country, for a dinner at Lake View Farm some fifteen miles east on the National road.

The Lake View Farm is on a little eminence overlooking Spring Lake Valley. The farm house is surrounded by an orchard furnishing shade and giving a comfortable resting place for guests.

Among the diversions provided were croquet, base ball, cards and pitching quoits. Dinner was served at 6:30 and the party reached Indianapolis on the return trip about 9 p. m.

It is a matter of interest that among the cars making the trip was one with an Exide battery four years old, that had never had a renewal. Yet this thirty-mile trip was well within the capacity of the battery. Experienced electric car owners will recognize this as an excellent battery record.

There was but one slight mishap on the trip, a flat tire that required pumping up, and this was quickly remedied. The entire party returned well satisfied with their experience and quite ready to repeat it at



Waverley Electrics During Sociability Run.

any time. Officials of the Waverley Company believe that sociability tours cause many to investigate the electric. They not only prove that the electric is reliable, but also that it is the modern way; easy to operate and easy to ride in.

Baker, Rauch & Lang Merger

Prominent Manufacturers Unite for Greater Production and Minimum of Selling Production

THE electric vehicle industry receives with much interest and considerable comment the announcement of a new company capitalized at \$2,500,000 and composed of two of the oldest and most prominent makers of electric vehicles in the United States.

The new organization will be known as the Baker R. & L. Company, uniting the Baker Motor Vehicle Company and the Rauch & Lang Carriage Company, both of Cleveland, Ohio.

The uniting of the two companies has been brought about for the purpose of producing both types of vehicles under the combined engineering ability of the two companies. It is stated that under the new organization the best possible service and facilities can be furnished to electric vehicle users.

Charles L. F. Wieber, president of the Rauch & Lang Company, has been retained as president. Fred R. White, of the Baker Motor Vehicle Company will officiate as first vice president; Charles E. J. Lang, of the Rauch & Lang Carriage Company, as second vice president; Robert C. Norton, treasurer, and George H. Kelly, Baker Motor Vehicle Company, secretary. F. W. Treadway has been retained as general counsel.

It is the intention of the combined company to continue to build both makes of cars, Rauch & Lang and Baker electrics; however, it will specialize on the Baker line in the light weight, \$2,475 coupe and on the various models of the Rauch & Lang. The combination gives the dealer an exceptional line of cars because it cares for everything that may be desired by the prospective customer. It presents the top mounted or bottom mounted worm, the Rauch & Lang type and the horizontal type of controller, a high-grade light weight four-passenger car or a large roomy five-passenger single drive or the five-passenger double drive car, and as a matter of fact, there is not a type of car or method of propulsion or control that cannot be supplied by the cars of the new company.

In the majority of instances the two agencies in the city will be combined in order to give the one

dealer the entire line and strengthen him to the point where he can make a profitable business from the selling of the cars of the new company.

To owners of either Baker or Rauch & Lang electrics the new organization announces that service will be granted as usual. The new company will increase

its distribution including many new cities and without a doubt the saving in manufacture resulting from quantity production will eventually result in a decrease in prices.

The new organization, through its efficient officers, is determined to have the dominating position in the electric vehicle field and every effort is being brought to play in making this possible.

Statement of policy has been made to all dealers representing the two manufacturers' lines, and is as follows:

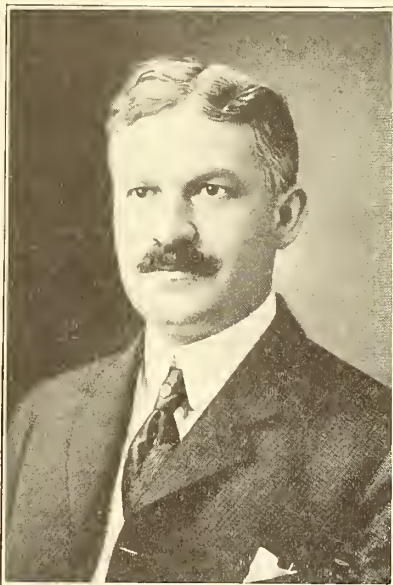
The consolidation of The Baker Motor Vehicle Company and The Rauch & Lang Carriage Company has been effected, and it seems advisable that all of the dealers and representatives should have a definite statement of the reasons regarding the consolidation and the future policy of the company.

In the first place, it must be definitely understood that there is no question of one company buying out the other, or either going out of business. The consolidation was formed primarily to secure

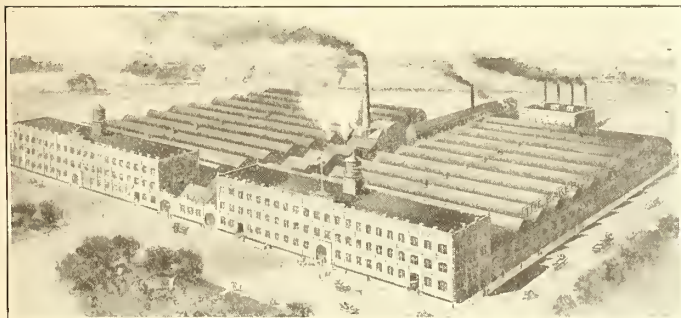
the dominating position in the electric vehicle industry; secondly, to build a dealer's organization of exceptional strength; thirdly, to eliminate duplication of models; fourthly, to eliminate duplication of advertising and sales expense.

By producing under one company Baker and Rauch & Lang electrics, dealers will be in a position to present the most complete line of high grade and best known electric cars in the world, which naturally will make possible securing a much larger portion of the electric car business than has been secured by both companies in the past. It naturally follows that the dealer who represents the combined line will be in a much stronger position, and much more able to make a very profitable business out of the sale of electric cars.

The new company will continue to make both Rauch & Lang electrics and Baker electrics, and they will be marketed under these names. It is probable that in the course of time the Baker electric will be confined to the light weight, four-passenger coupe, so popular in certain sections, and Rauch & Lang electrics will be confined to the large, roomy, five-passenger and double drive cars, with, of course, the minor additions to the line, of roadsters, town cars, etc.



Charles L. F. Wieber, President,
Baker, R. & L. Company.



Baker Motor Vehicle Company, Cleveland.



Rauch & Lang Carriage Company, Cleveland.

There is no question of one car being a higher grade car than the other. The entire product of The Baker R. & L. Company is to be of the highest possible grade. The difference in price in the models being justified by the difference in the size and battery equipments.

The dealer will immediately appreciate that in the wide variety of models he will have an opportunity of offering either the vertical or horizontal control, top or bottom mounted worm, as well as all other details which have been features in the construction of the two cars and which in competition practically afford everything which any manufacturer can offer in the construction of electrics.

The new company will proceed in the most aggressive manner possible to put its product properly before the public, and the dealers can rest assured of the utmost co-operation from the new organization. The customers will appreciate the combination, especially when they can be assured that the new company is the strongest electric vehicle factor in the world, financially, in the quality of its product and its ability due to the combination, to furnish excellent service.

The new company will specialize in the promotion of the Baker worm gear coupe, which sells for \$2,475, and is commonly known as the "Light weight Baker." This model can be furnished in either lever or wheel steer and has specifications as follows:

Wheel base, 90 inches; tread, Standard; rear axle, worm gear; driving mechanism, two types; one with controller and steering levers, the other with steering wheel and controller (on wheel), both operated from left rear seat.

Controller lever, horizontal type; seven speeds forward, three reverse; springs, semi-elliptic front; cantilever rear; battery, 32 cells, 11-plate high capacity. Ironclad Exide at extra cost; tires, 32x4 special electric pneumatic; 34x4 special electric cushion.

Body, pure streamline design. Aluminum panels, with



Charles E. Lang, Second Vice-President.



Fred R. White, Vice-President.

full limousine back. Fenders, crowned metal.

Painting, body—black; panels—blue, green or maroon; or body and panels, Baker green, with brown wheels. Individual combinations at small extra charge.

Equipment, head lamps, Colonial side lamps, tail lamp, interior lamps which light automatically when door is opened; combination lighting switch which controls all lights; ventilator; volt ammeter; automatic circuit breaker. Complete outfit of tools.

The Rauch & Lang models will be continued. This type will provide

the roomy vehicles catering especially to those desiring a high-class electric limousine.

to those desiring a high-class electric limousine.

It is expected that the new combination will be instrumental in giving the using public a better purchase, satisfactory service and in general cause a greater advance in the success of the industry.

In the last two years the industry has seen a number of mergers of electric car manufacturers. In each instance such mergers were for greater production rather than for financial reasons. In every instance the factors of such combinations have been able to manufacture on a more economical basis. As a result better vehicles, better sales policy, more liberal service to the public and a far lower selling price have been made possible. It is to be expected that this latest organization with its already excellent facilities will likewise work a maximum efficiency. And the public and the industry will, without a doubt, profit likewise.

The public has waited for a new era and the latest merger predicts its arrival.



Robert C. Norton, Treasurer.



George H. Kelly, Secretary.



Francis W. Treadway, Counsel.

Greatest Problem in the Automobile Industry

An Address Presented Before a Joint Meeting of the St. Louis Accessory Association and Advertising Club

THE big problem in the automobile industry—and I might say

BY EDWARD S. BABCOX*

in any industry—is not manufacturing, nor capital, nor materials, nor labor. Bankers have come to understand the business and now support it with their money. Materials are plentiful. Factories which produce special parts are increasing, and the entire mechanical problem of making and assembling an automobile has during the last twenty years been just about completely solved. But with increasing competition and the consequent need for increasing efficiency and decreasing selling price, the great need is for economy.

The pioneers in the automobile industry being primarily manufacturing men, have concentrated their efforts toward economy on the manufacturing division of their business. Efficiency methods have been instituted. Men like Frederick W. Taylor and Harrington Emerson have been employed to put the factories on a profitable and efficient basis. So we may say that the problems in the manufacturing end of the automobile and accessory business have been met and conquered by the captains of the craft.

The present-day problem—the great master-problem of all—is found in none of these things. The big thinkers, the inventors and the executive chiefs have fought and thought their way through these barriers.

The big problem then, is what?

In my judgment, one word covers it, and that word is "distribution"—a wonderful, all-comprehensive word. So vital a factor is this and so much appreciated by the public, that the manufacturers who have mastered it, are now advertising it as one of their advantages.

Economical distribution is a very superior talking point and ranks equally high with intrinsic quality and merit of the goods themselves. The public is awake; they have heard that each company allows so much for the selling expense on each car, or unit of merchandise. They, therefore, quibble on price more than they used to.

You have some people coming into your stores trying to buy a car or other article at 10 per cent dis-

count because they will tell you you have had no selling expense in their case. They forget the cost of advertising, branch maintenance, display rooms, etc., and make the mistake of thinking because no personal salesman had called on them, no selling effort has been extended in their direction.

Now, distribution is one of the three great subdivisions of business: (1) Production; (2) Distribution; (3) Exchange.

Distribution is the pivot of commerce. Labor, capital, materials, factories, etc., go to make up production. Banks, accounting systems, credits, etc., make up exchange.

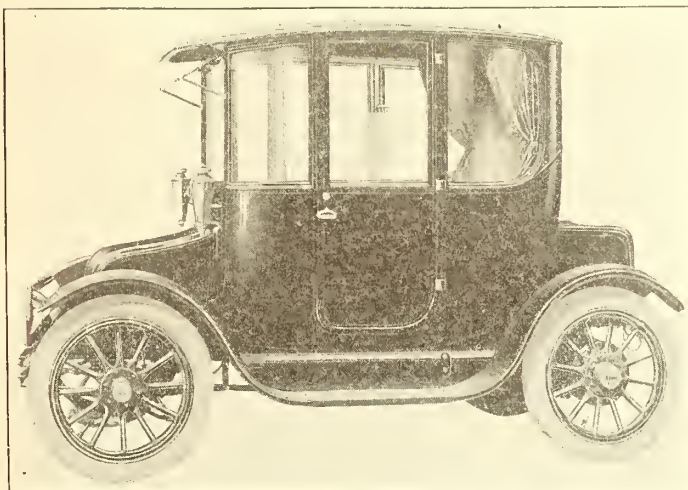
These things form the bark of the "Tree of Commerce." The real heart of the tree, however, and the part which gives it life and pulsing vigor, is distribution. A factory may turn out thousands of cars or speedometers or tires, but if they cannot be gotten economically from factory to consumer, nothing is accomplished. Distribution is the great bridge over the chasm between the factory and user.

ANALYZING THE MARKET

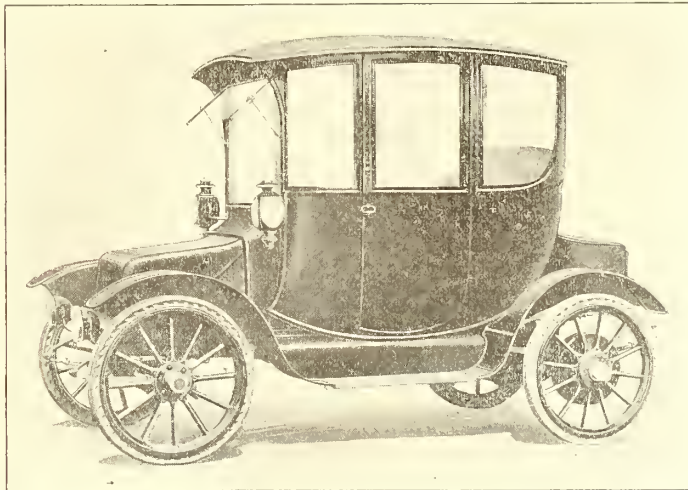
The problem of the sales manager is this—"How many people in the world, or in the United States, can buy my product? In other words, what is my market?" These questions are vital. They control the manufacturing because no wise manufacturer produces more than can be sold, or provides for more business than can possibly be secured.

In a certain city the other day I talked with a man who is erecting a very wonderful garage. When I first saw him he was planning to take care of several thousand motor trucks. He was surprised when I showed him, after a little analysis and investigation, that there were only six or seven hundred trucks in his whole territory, and that he could not hope to get business from more than 10 or 20 per cent of these. These facts caused him to alter his plans.

In a big national marketing problem the sales manager must analyze his field carefully. The United States census figures provide unlimited information and enable



Baker, R. & L. "Light Weight" Coupe.



A Baker, R. & L. Brougham.

*Advertising Manager, Firestone Tire & Rubber Company.

him to assign sales quotas to each territory in a very intelligent and accurate way.

He knows, for instance, that there are about five and a half million families in the United States having an income of \$1,200, and about three and a quarter million families with an income of \$1,800 or more. If we consider \$1,800 the minimum income for an automobile-owning family, statistics prove that the field is now 59 per cent developed—that is, 59 out of every 100 people who can afford an automobile now own one. If you work on the \$1,200 basis, it is 35 per cent developed.

Your live sales manager knows that there are today about one and three-quarter million automobiles in the United States. He knows that there are 10,000 in St. Louis. He knows that there are 23,295 people in St. Louis who can afford an automobile, and he knows that about 43 per cent of these possible automobile buyers now own one or more cars. With these figures to guide him, he can direct selling efforts right here in St. Louis in a very successful manner.

Now, an automobile or accessory is not finally sold until it reaches the consumer. The selling system lines up like a baseball diamond. The manufacturer is at first base, his salesmen at second, the dealer at third and the consumer at home plate. In business, as in baseball, nothing counts until the runner (product) reaches home.

We are dealing with fundamental principles here, and in wrestling with this giant problem of distribution you will find your successful sales manager, or branch manager, or territorial salesman, analyzing his work right down to its elements. These men know that in order to make a sale, five things are necessary on the part of the customer—attention, interest, desire, conviction, action. Every buyer passes through these stages in this order before he buys, and a sale is always made in his mind before it is made on your order book. In a word, the selling problem is really a manufacturing problem—the converting of raw material into finished product—the converting of the public into customers.

That's the way the sales manager analyzes his job, and realizes his success. So he reverts back to the manufacturing department to cash in on their experience, if he is wise. The only difference between his job and the manufacturing department work is in the materials—that is, they are both making something which does not exist, out of something which does exist. One is working with human people and the other is working with iron, steel, leather, etc.

Did you ever see a \$100 a week engineer or superintendent trucking pig iron in a factory? Did you ever see a foreman doing day laborer's work? Did you ever see a machinist at \$6 a day trying to do carpenter's work about which he knew nothing?

No, you never did in any modern factory. The efficiency in the manufacturing division of business has specialized the work of individuals and eliminated all possibility of such incongruities.

But look here!

How often do we see things in our sales and distributing organizations which are like these glaring deficiencies, I have mentioned as being impossible in any modern factory. Recently, I was talking with a salesman of a certain company who told me that if he could not do all the work expected of him in two hours a day so he could have the rest of the day for his own pleasure, he would count himself no good. He was soldiering on his job and had been for months. Yet, the drag-net of the sales department in that organization had never

caught him. How long would this kind of thing go on in the big factories represented here tonight?

How many of your salesmen when they start out in the morning have their work laid out definitely so that they know just exactly what they are going to do, and how they are going to spend their time in the best interests of the company? How often do you managers sit down and discuss their work with your men and give them the benefit of your training and knowledge?

In the modern factory, no man is permitted to do anything which a cheaper man can do equally well. These factories are highly organized. Each individual does the work which he is best qualified to do. As a matter of fact, vocational experts are now selecting men for factory work scientifically. They no longer send in a 250-pound Russian laborer to the foreman of the department handling work involving great detail. Men are picked for the work they can best do. They are given plenty of help so that it may be done right and at minimum cost.

Now, what is the salesman's chief assistant? Is it his sales manager, his factory, his product, or is it the thing I maintain it is—*advertising*?

Advertising is the great labor-saving device of distribution. It is an effective method of helping salesmen manufacture the general public into customers. It is the pioneer of industry. It goes ahead of the sales force and tells millions of people about your product. While President McKinley was making an address in Philadelphia some years ago he was interrupted by a rude rabble and being unable to quell it he stooped down and said to the reporters in front of him, "Let the thousands rail, I talk to millions here." And so it is with advertising.

The advertising of your respective companies is like a great national business card flung far and wide throughout all the states. Advertising saves salesmen because it does the hard, laborious work of distribution—it introduces and makes known to the public the product you are selling.

The wise salesman, the most successful salesmen, study advertising and use it in their work. That great master lawyer, Elihu Root, seldom takes time to prepare preliminary briefs and arguments in a case. Assistants do this. Their work is placed in his hands and he with his wide experience and knowledge uses it to fight the case in court. Advertising begins and lays the foundation for a sales campaign—but the trained, experienced, indispensable salesmen finish it.

In Washington they are building a wonderful structure to be used as the Masonic Consistory. It is a replica of King Solomon's Temple. On either side of the approach to the building is the great Sphinx carved out of solid stone. While there the other day, I saw ordinary workmen with heavy mallets and sledges breaking off the big corners of one of these stones. On the other side under a temporary housing were wonderful sculptors using the finest of mallets and chisels putting character into the finished work. Advertising may knock off the rough edges and lay the foundation for the campaign, but the salesman with his delicate sense of perception and understanding must complete the job.

In a certain large concern, a travelling salesman some years ago, after a long trip, went to the president and said he could not succeed in his work because he had to use half of his time telling possible customers what his concern made and who they were. He said, "You run some ads in the trade papers and send out letters ahead of me so that I can use all of my time

selling and not two-thirds of it trying to find people to sell to, and I will show you results." The temerity of that man was rewarded, and he is now a successful sales manager. He made advertising do the drudgery of selling, the ringing of door bells and the sifting out of possible buyers, and used his salesmen as sharpshooters to pick off the customers. Hugh Chalmers says that the only difference between advertising and selling is, that advertising runs a public school while salesmanship conducts a private school.

CO-OPERATION THE ONLY SOLUTION

Some say that it is only by the co-operation of sales and advertising forces that this giant problem of distribution can be solved. The relative efficiency of factory is ahead of the efficiency of sales organizations, as a rule, because factory men deal with tangible matter, while salesmen deal with human beings—no two alike. Right here, much could be said about the psychology of selling and the study that is necessary by salesmen if they would succeed.

We all know well that it is possible today to tell by the features of man whether he is keen or dull, whether he is level-headed or excitable, whether he is lovable or cold-blooded. Volumes have been written and much has been done to scientize this selection of men and analysis of character. Some large department stores have classes meeting on company time for the study of character analysis. They find it pays to have their clerks understand at a glance the kind of people they are dealing with.

The problem of the factories has developed efficiency experts in recent years. Frederick W. Taylor, of Philadelphia, and Harrington Emerson, of New York, are prominent among these. Today a man who assumes to know as much about distribution as these men know about factory efficiency is looked upon with some suspicion, and as more or less as a fake. He is up against just what these men were up against before Brandeis dropped his bomb about saving a million dollars a day for the railroads if they should install efficiency programs.

I predict that some day in the very near future, some colossal sales manager will rise above all the rest and show manufacturers how to train men to work with factory efficiency; how to study people and character. He will show salesmen how to plan their work scientifically. He will show them how advertising, if properly understood and used, may be co-ordinated with personal selling effort and made of exceptional assistance to the entire organization.

This man will show the sales force that after all, while there are five great M's in business—money, material, machinery, markets and men—that the basis of the entire structure of business is man.

And so I believe that while our manufacturing systems are not perfect yet, they are infinitely in advance of our marketing methods in the industry at large.

I further believe that our marketing methods are on the high road to increased efficiency, and that great results will come when our sales organizations really appreciate how advertising plays a vital part in their specific work.

My parting plea, therefore, is—study the advertising policies and campaigns of your respective organizations, support them and the men responsible for them with all your heart and soul. From this co-operation nothing can result except the increased efficiency for which every man of us is struggling.

Chicago Issues Traffic Suggestions

The Chicago section, Electric Vehicle Association, at a recent meeting, appointed a special committee of which D. C. Arlington, Chicago manager, Philadelphia Storage Battery Company, is chairman, for the purpose of preparing a folder in the proper observance of traffic regulations.

This interesting little booklet is entitled "Some Traffic Suggestions," and presents to the electric vehicle using public some very important suggestions.

Owners, garages, manufacturers and dealers have been supplied with the folders and these suggestions will, without a doubt, have a special bearing on electric vehicle owners.

The following includes the suggestions as set forth:

We wish to encourage the owners and operators of electric cars in the proper and complete observance of the traffic regulations as imposed by the police department of this city. If any car owner is without a copy of the rules and regulations of street traffic, same may be obtained by addressing the vehicle bureau, police headquarters. It is the desire of the Electric Vehicle Association of America that all owners of electric cars co-operate with the traffic department in an endeavor to facilitate traffic on our streets and boulevards and especially in the loop district.

In addition to the general traffic rules, we wish to call to the particular attention of those driving electric cars at reduced speed, to a fault that could be very easily corrected. It seems to be the disposition of drivers of electric cars, whether slow going or fast, to cling to the crown of the street, thereby impeding traffic, especially during rush hours, for, as you will find in the traffic rules, it is not lawful for those coming behind to pass on your right, and those who do so not only violate a traffic regulation, but place you and themselves in danger. We believe this is largely due to the idea that it is necessary to keep the car on a level in order to prevent acid in the battery cells from spilling. There is no danger whatever of this when driving on the very slight incline found at the side of any of Chicago streets. The obvious thing, therefore, for a slow going electric is to travel on the right side of the street near the curb, leaving the center to those who wish to drive at a higher speed.

If all automobile drivers would follow the "Golden Rule" and show a little more consideration for the other fellow, general speeding up of traffic would be possible and there would be fewer accidents.

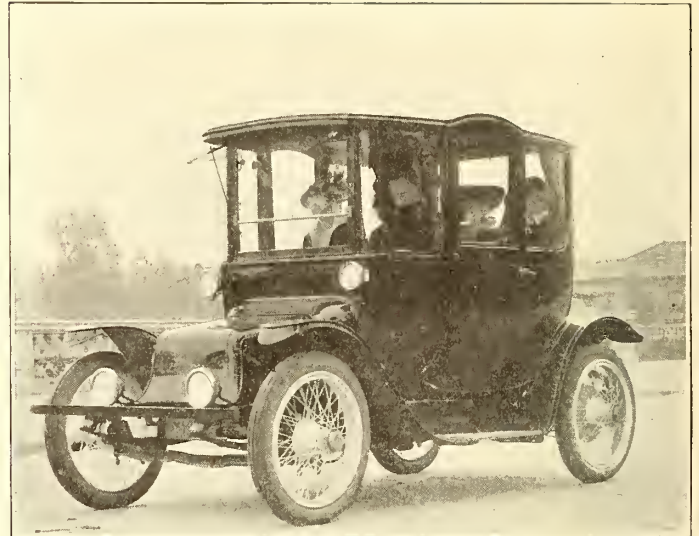
We trust that those who read this will give the matter their very best consideration and follow the rules, thereby helping themselves and the traffic squad, who have our interests at heart, and who work so diligently to make the path of the automobile driver in our city "run smooth."

Hupp-Yeats "Guarantee for Life"

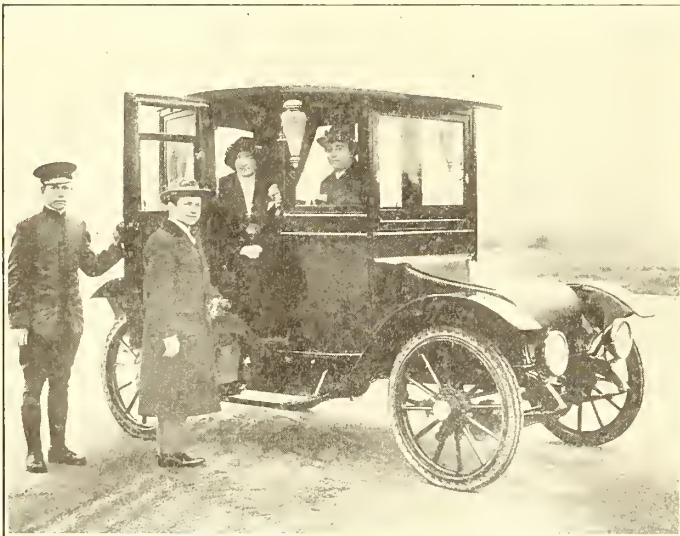
Hupp-Yeats Electric Car Company, Detroit, Mich., announces a very unique guarantee: "A Guarantee for Life." The company guarantees its product free from defects is material or workmanship during the life of the car, and guarantees to replace, free of charge, any defective material returned to the factory for inspection.

Hupp-Yeats electric cars have been sold since 1910 and in the last few years they have been developed to such an extent that for a moderately priced car, they represent many of the best methods in electric vehicle construction. In the very last models, a motor generator type electric charger is furnished as regular equipment. The principal aim is to furnish all possible apparatus necessary in the maintenance and operation of the vehicle.

The Hupp-Yeats has eliminated all extra elegance and has been quite successful in giving the public a moderate priced car, substantial and practical.



"Al Jolson Girlies" During Their Stay in Chicago Were Entertained by the Chicago Electric in Various Trips Through Chicago Parks. The Cars Shown Are the Latest Models, Roadster and Brougham, Equipped with Rudge-Whitworth Wire Wheels and All Other Modern Improvements.



Mischa Elman Invariably Comments on the Luxuriousness of His Baker Brougham.



Alice Neilson, Popular Opera Singer, Has Used an Electric for a Number of Years. The Baker Shown Is Her Latest Purchase.



Edgar Smith, Playwright, and Daughter Margery, of Manhattan, N. Y., Own and Find Constant Companionship in Their Ranch and Lang Coupe.



Carolina White, Grand Opera Singer and Probably the Most Beautiful Woman on the Stage, in a Waverley Electric Which She Has Forwarded to All Cities in Her Tours.

Electrically Propelled Fire Apparatus

Installations in Various Great Cities Where Electrics Are Operating Successfully in Exacting Work

EVER since the first fire department was organized in ancient Rome, for centuries countries have vied with one another in the development of efficient fire controlling apparatus, endeavoring to make fire the "servant" of man rather than the "scourge" of man. One of the greatest problems has been the propulsion of fire apparatus and at present the greatest effort is being made to develop motor propelled appliances. It is interesting to follow the development of fire-fighting from the early period when the "bucket brigade" was the most efficient means of combating the enemy. The hand engine and man-pulled hose carriage were considered marvels of efficiency in their day, but it is with a mixture of curiosity and amusement that we now look upon apparatus relegated to the glass cases and rusty environs of museums. In 1875, shortly after the period of the great fires which devastated some of our cities, a new movement sprang up which heralded modern building era and modern fire controlling appliances. It was at this time that steam engines came into general use. The inclusion of fire fighting amongst the scientific problems of the day as one worthy of serious consideration dates from modern times, and hence the many improvements which have been introduced into its practice are all of such recent origin that even now they are only just emerging from an embryonic stage.

It is with considerable interest that fire chiefs throughout the country are watching the results and performance of electrically propelled fire trucks and engines in the cities where they have been adopted. The very many obstacles that present themselves in the changing of horse-drawn to motorized apparatus of a large fire department are such that the utmost care must be used to secure that method of propulsion for apparatus that will give speed, reliability, and efficiency together with ease, and economy of operation. In these points the advantage of the electric over other methods of propulsion is fast establishing itself.

The first storage battery fire engine in this country came into existence in 1912 when Engine 217 of the New York Fire Department was converted into an electrically propelled apparatus. The *Edison Monthly* gives an interesting account of its history and operation:

"The early history of 217 is well known. The engine, originally a horse-drawn steamer of the

BY A. JACKSON MARSHALL

largest size, was converted to the motor type by the removal of its forward running gear and the substitution of two couple gear freight wheels, a storage battery and the necessary steering and controlling devices. This conversion cost \$4,000 and it gave to the city an engine that would have cost not less than ten thousand dollars had new apparatus been purchased—in other words a

dependable steam pumping engine was continued in service with added speed and greater radius of operation.

"With the exception of battery renewals and replacement of minor parts, it stands today just as it did when it went in service on April 24, 1912. The bills for repairs and renewals during the two years have come to just \$744.29, \$486.97 of which was for battery renewals that were made after the machine had been in service a year and a half. The balance includes minor parts, labor and decorating, for the engine has

taken part in two street parades. Adding depreciation and the cost of charging, operation of this engine has cost the city just \$1,370.03.

"The cost of motive power for this same type of engine, but with horses instead of a storage battery, is \$1,469.06 for two years. These figures are based on the records of two companies which ordinarily respond to about the same number of calls as 217. The sum includes depreciation on horses and harness and stable equipment, which at 10 per cent is \$105.98 a year. Feed, shoes and veterinary service for three horses cost \$516.86, while the repairs vary. As a rule, better service costs more money. In this case the department not only has a better price of apparatus, but one on which it is saving money. The economy claim is supported by the records of the department—the claim of superiority is based on the actual performance of the engine. In the case of fire fighting this is rated principally by the speed in getting to the blaze. To begin with, the engine saves time in getting out of the house, for there are no horses to harness (incidentally the passing of the horse has done away with the stalls, and the space thus saved is utilized for garaging the car of one of the department chaplains). With no time lost in harnessing and with the greater speed through the streets and a wider range of operation, No. 217 is often the first engine at hydrants to which in the days of the horses it was due third."

The experience of Philadelphia with electric fire apparatus has been most successful. Two years ago the first step was taken and Engine No. 20, a first-class steam fire engine, weighing 10,500 pounds, horse-



Philadelphia Recommends Electric Fire Trucks.

*Secretary, Electric Vehicle Association.

drawn, was equipped with an attached two-wheel storage battery tractor. The excellent performance of Engine No. 20 during the tests made in the congested traffic zone induced the bureau to convert two smaller class steam fire engines, horse-drawn, to battery tractors, also the two horse-drawn, high pressure hose wagons to storage battery apparatus. In addition to these five pieces of electric apparatus the city of Philadelphia has recently ordered two combination hose and chemical wagons, and one 65-foot aerial truck to be storage battery driven. This re-order should be especially gratifying to the manufacturer as showing that the electric has proved satisfactory under high speed conditions. In a report on electric fire apparatus given by Chief Mechanician George S. Walker before the Electric Vehicle Association Convention last year some very interesting tests were described in which the electric excelled all the specifications demanded. In one performance of a fire engine equipped with electric tractor, a distance of four miles was covered in eleven minutes, while the same distance consumed 30 minutes with horsedrawn apparatus. Chief Walker says of this performance:

This test was made to corroborate our belief in the battery tractor, and any person conversant with the territory traversed is well aware that it is no easy going. Along that route there are many hills and one extremely sharp, dangerous curve, and the time made on that run—11 minutes—stands today as record time, not excelled by any fire apparatus of any make, weighing very nearly six tons, over the same route. . . . The facts presented to me after over a year's experience are so satisfactory and the results so gratifying that I unhesitatingly say that for use in the congested traffic zone and the close adjacent territory thereto, of any large city similarly situated as is Philadelphia, the storage battery tractor is the very best method of propulsion for fire apparatus that is presented by any present-day methods, and I sincerely wish that the Bureau will be able in the near future to receive the necessary funds, that the present small number of motor apparatus may be so augmented that our city will possess the requisite number of apparatus that modern methods demand of the department of public safety.

No more convincing proof of the superiority of the electric fire apparatus could be obtained than a letter from Chief Engineer W. H. Daggett of Springfield, Mass., in which he states that the actual use in the service of the department has shown one of the chief advantages of battery driven apparatus to be absolute positiveness in starting. Further that the pieces have never failed to start instantly and experience with them has been such as to inspire a feeling of confidence that they are sure to start when needed, at any time or place. These gas-cars are as good as those owned by any city, but there are times when the crank is used more than once to start the engine, and the larger the engine the more time it takes, also the greater the difficulty to start. Up to the present time we have not thought of failure in starting with our battery driven apparatus and no piece has been out of service a minute since they were installed. The battery in the aerial truck is two years old. Making due allowance for the operation of the batteries under adverse conditions, the cost of maintenance of a piece of apparatus is as follows:

Renewal of plates (in 4 yrs.)	\$500.00
Renewal of separators (in 2 yrs.) 80 cells @ 35c.	28.00
Charging batteries (in 4 yrs. @ \$60.00 per year)	240.00
Broken jars (4 yrs. @ \$7.00 per yr.)	28.00

Total in 4 years	\$796.00
Total in 1 year	199.00

In other words, \$200 per year is estimated as the cost of maintenance of a battery driven aerial ladder

truck of such size and capacity as was formerly drawn to fires by three horses.

When it is considered that the maintenance and upkeep of three horses varies from \$500 to \$600 per year, it is evident why Chief Daggett is so enthusiastic in his report of the electric apparatus.

In Baltimore, Md., Engine No. 32 of the fire department is equipped with a storage battery tractor, which is the most reliable and economical apparatus in the whole department, and can always be depended upon.

The city of Akron, Ohio, owns a 65-foot aerial truck, equipped with electric tractor, which, at a demonstration of speed and climbing grades, went up a 13 per cent grade when carrying a full complement of men and equipment and attached to the truck, at the rate of eleven miles per hour, and on level streets the tractor propelled the truck at the rate of twenty-six miles per hour without any trouble or showing any loss of power in the least.

"In my judgment," said Chief Mertz, "the storage battery has solved the problem of converting horse-drawn steam fire engines and hook and ladder trucks of any fire department to self-propelled apparatus from a practical standpoint."

As in other departments where the horse is being superseded by self-propelled vehicles it will not be long before every fire department of any size will be entirely motorized.

It is now a question which will prove the more efficient means of propulsion, gas or the storage battery. It is an established fact that the electric vehicle is more economical to run than a gasoline car. Without a doubt the gasoline vehicle has its own sphere and as Chief Avery of Worcester, Mass., states its use in suburban districts will not be superseded, but for the exacting work in the congested and business centers, "the electric vehicle," he states, "will be the future machine for fire-fighting."

The economy of operating an electric is large because of its few working parts. As against the gasoline motor and transmission and the large number of working parts, a number of which are reciprocating in their action, the electric is driven by one, two or four motors, as the case may be, and the movement is a revolving one, the least wearing of all movements. In addition, these motors are revolved by electric magnetism and not by destructive explosive forces. The electric car has less than one-half the total parts required with a gasoline car. The life of the storage battery in this class of service is estimated at upwards of five years with one renewal. This estimation is given by Chief Daggett of Springfield, who has had a considerable experience with electric fire apparatus.

As for reliability, many of the above statements of various fire chiefs bear witness to the absolute dependability of the electric. Its ease of operation and promptness of action arouse utter confidence in it. "The battery tractor has the advantage of the gasoline apparatus," states Chief Walker, "in answering alarms, because of the fact that it is simply necessary for the driver to get on the seat, throw on his controller, and it is under headway in less time than is taken to crank the motor. It eliminates the characteristic ignition and carburetor troubles in starting the motor in cold weather, and the attendant radiator troubles of freezing and leaking"

Another characteristic of the electric fire ap-

paratus, which should commend itself to the heads of fire departments, is its absolute cleanliness. The electric does away with the offensive odors of horses, and the customary litter, dirt and flies, allows more room in the station, eliminates all odors of gasoline and oil, reduces the element of fire, which is characteristic of gasoline equipment. As there is comparatively no grease it is much easier to keep the apparatus clean and of good appearance, all of which adds very greatly to the sanitation of the station.

Although fire apparatus usually has the right of way there are times when it has to be held up on account of congested traffic, or for other reasons. At such times as these the simplicity of the electric becomes all the more apparent. The quick, positive control is a big factor in operating ponderous machines in crowded city streets. The electric stops instantly and in starting, there is no delay in acquiring momentum again, there being no time lost in gear shifting. This positiveness of control plays a great part in the safety element of the electric which is one of its prime virtues.

It is no unusual thing to see a horseless fire in this day and age, and it is to be hoped that the efficiency of the fire department of our cities will continue to increase by the adoption of electric apparatus which has proved so efficient and reliable.

Electric Pole Truck Operating Costs

The six-ton electric pole truck put into service by the Philadelphia (Pa.) Electric Company, March 21, 1913, had covered up to May 1, 1915, 17,948 miles. It has averaged 30 miles per day in service, the maximum daily mileage being 53. During the two years it has taken 33,845 kwh. of energy, or 1.88 kwh. per mile. As testimony to the efficiency, economy and excellent performance of this electric pole truck, a second truck which is practically a duplicate of the first was purchased on March 18, 1915. The original battery in the first truck was of the twenty-one plate type, but when the time came for renewal a twenty-three plate type was installed. The batteries in both of the trucks have forty-four cells, and it is claimed that they are the largest electric-vehicle batteries in use in the state of Pennsylvania. The acquisition of this second truck will enable the company to eliminate to a great degree the use of horses for hauling poles.

The company's force recently hauled five heavy 45-foot poles from the pole yard, Seventeenth street and Sedgley avenue, to Newton Square, Pa., for the Bell Telephone Company. While there is nothing significant in a 26-mile run, it is interesting to note that the distance was covered in six and three-quarter hours with a current consumption of 305 amp-hr. The poles hauled in this instance were above the average size, the entire load weighing approximately eight tons. The great weight and the hilly condition of the country traveled caused the truck at times to consume three times more energy than under normal conditions.

The cost of this trip was \$10.12, or \$1.50 per hour, or slightly under 5 cents per ton-mile. Formerly this work required a four-horse team twenty hours, at \$1.20 per hour, or \$24. Thus the cost by electric vehicle represented a saving of approximately 40 per cent over the cost of haulage using horses.

The advantages to be derived by the use of electric trucks for pole hauling, as compared with the use of

horses, are set forth by the superintendent of the company's transportation department as follows:

(1) The saving of time to and from jobs, which is important.

(2) More economy, because more work can be done in less time.

(3) Accidents are less likely, because the electric truck occupies less space on the street, because the driver has better control over it, and because it can turn corners with perfect safety, which is impossible with a four-horse pole truck.

(4) Loading and unloading can be done with less labor and with perfect safety by using the motor and winch.

The new truck is shown in the accompanying illustration. It differs from the old truck only in the steering device for the rear wheels, which is similar to that now used on hook-and-ladder fire trucks to facilitate the rounding of corners.

Electrics in Railroad Freight Houses

Battery-driven industrial trucks are increasing in favor for handling goods in both transfer houses and freight houses, according to the report of the committee on yards and terminals of the American Railway Engineering Association, presented at the Chicago meeting of the association. Many railroad officials have found the electric truck particularly useful when used as a locomotive for drawing a number of trailer trucks, for which it has ample power.

One railroad, which has fifty electric trucks in transfer service at its dock terminals, notes an operating

TABLE I—COMPARATIVE COST OF ELECTRIC-TRUCK OPERATION.

	Tons Handled by Electric Trucks	Electric Trucks (Cents per Ton)	Hand Trucks (Cents per Ton)
Eastbound:			
Vessel to dock.....	24,050	19.12	29.23
Dock to car.....	12,383	11.38	13.15
Total		30.50	42.38
Westbound:			
Car to vessel.....	2,452	21.15	30.30

cost of 8.74 per truck per month, including energy at 3.3 cents per kwh. In comparison with hand trucks, the cost of electric-truck operation was as shown in Table I.

TABLE II—AVERAGE RESULTS OF OPERATION.

	Average per Month
Maintenance and repairs, including labor and material..	\$ 480.71
Cost of energy.....	487.99
Labor expense, including foremen, checkers, truck operators, freight handlers, sealers and coopers.....	5,496.58
Interest on investment and depreciation of property.....	778.13
Total average expense per month.....	\$7,243.41
Average number of tons handled per month.....	17,010
Average cost per ton, cents.....	42.58
Average number of trucks in use per month.....	47

Later these trucks were put in service at a transfer station. The average results, based on seven months' operation (February to August, 1914) are given in Table II.

Police, fire department, fire patrol, traffic emergency repair, United States mail vehicles and ambulances for persons and animals shall have the right of way in any street and through any procession.

Operating Costs of Commercial Electrics

Recently an investigation was made of the cost of maintaining electric commercial vehicles in 145 large installations totaling 3,095 trucks in some 30 different cities.

As a result of this investigation it was found that more than 3,000 electric vehicles included in the tables are now being operated for the following average daily costs: One-third ton, \$5.68; $\frac{1}{2}$ ton, \$6.34; $\frac{3}{4}$ ton, \$7.02; 1 ton, \$7.56; $1\frac{1}{2}$ ton, \$8.15; 2 ton, \$8.92; $3\frac{1}{2}$ ton, \$10.38; 5 ton, \$11.74.

Actual verifications in writing over the signature of the owner or operator, cover 50 per cent of the cases investigated, while the others personally acknowledge the truth of the figures given.

Waverley electric trucks were represented in 15 of the installations investigated and a comparison of figures of those installations with other shows that the Waverley cost was lower than the average in six of the eight classes, the net saving in those six classes being 42 cents per day. In one class, including some 36 Waverleys, the Waverley cost was .03 cents or $\frac{1}{2}$ of 1 per cent above the daily average and in the remaining class represented by a single Waverley only the cost was 26 cents or 2 per cent above the average of the class. So that in 6 out of 8 classes Waverley was below the average of all.

The cost analysis included investment, spare parts, equipment, garage equipment, and office equipment on the total of which 3 per cent interest was charged to annual operating expenses. These expenses also included depreciation of 10 per cent, liability and fire insurance and license fees. Maintenance included tire upkeep, battery upkeep, and mechanical upkeep. Electric power, supplies, labor, rent, light, etc., were charged to garaging. Driver's wages were charged to operation and salaries and office expense to administration. Current was figured in all cases at 4 cents per kwh. and wages were averaged at \$2 a day for light delivery wagons, \$2.50 a day for 1 to 3 ton trucks and \$3 a day for heavier trucks.

The average daily cost of all the trucks investigated was exceedingly low and many gratifying expressions were received from the owners and operators.

Within a period of ten years horse carriages have almost totally disappeared from the streets of the larger cities and transition from animal to mechanical transportation of merchandise is now rapidly taking place. It is evident from all the available reports of comparative expense that the most economical system of delivery now in use is the electric truck.

Hanlon Windshield Patent Injunction Filed

Windshields that have an adjustable "visor" or small swinging panel at the top in front of the top panel of the shield, as a protection against rain or snow, are the subject of an injunction that has been issued by the United States District Court at Cleveland, O., against all the members of the National Automobile Chamber of Commerce, except the Anderson Electric Car Company, of Detroit, which was one of the plaintiffs. If the visor is not adjustable, it does not come under the injunction.

The order for the injunction is the result of a patent infringement suit on the windshield re-issue patent No. 13,653, to Hanlon, December 2, 1913, against the Rauch & Lang Carriage Company, of Cleveland. The suit was defended by the National

Automobile Chamber of Commerce, but was decided for the plaintiffs, William B. Hanlon et al., last March. The injunction order is against the Rauch & Lang Carriage Company, the National Automobile Chamber of Commerce, and all its members, except the Anderson company. An appeal is to be taken by the Chamber.

The Hanlon patent was invented by a Pittsburgh trolley motorman, for the front windows of trolley car vestibules. The ordinary rain-vision windshields as used on touring cars do not come under the decision, and closed cars that have a closed window in front do not infringe, provided the extra visor at the top is made immovable and non-adjustable.

Uncle Sam Buys Electrics

The general supply committee has awarded the following contracts for furnishing the executive departments here with motor vehicles during the fiscal year beginning July 1, 1915:

The Waverley Company, Indianapolis, electric truck, 1,000 pounds capacity, \$1,660; with screen side express body, \$1,920; with standard full panel body, \$1,925.

1,500-pound electric truck, no award.

The Waverley Company, 2,000-pound truck, \$2,095; \$2,385; \$2,425; \$2,450.

Kentucky Wagon Company, 2-ton Urban electric truck, \$2,650; \$2,985; \$2,010.

Baker Motor Vehicle Company, Cleveland, O., 3-ton Baker electric truck, \$2,975; \$3,360; \$3,435.

800 to 1,000-pound gasoline truck; no award.

Chicago Department Stores to Furnish Garages

Organized electric car men in Chicago are preparing an appeal to the owners of the big department stores to institute garage facilities for electric cars. The local organization will endeavor to obtain from the merchants a promise of space, so that women shoppers will be able to run their cars into the basement garages while they are shopping.

It is suggested that the merchants make the garage self-sustaining by charging a nominal fee of 25 cents. The chances are that the women who drive their electrics downtown would reciprocate by doing all their shopping in the store in which they are able to garage their electrics.

Eagle Electric Forms in Detroit

Under the name Eagle Electric Automobile Company there has been incorporated under Michigan laws a company for the purpose of manufacturing electric pleasure cars and delivery wagons. The company has a capitalization of \$100,000. The stockholders are: Herman A. Schmidt, Cass C. Smith and Henry Clay Judson, all of Detroit.

Century Electric Car Company Absorbed

The Century Electric Car Company, which manufactured the Century electric at Detroit, has been absorbed by a new company, incorporated under the name Century Mfg. Co. The capital stock of the company is \$40,000 and the incorporators are: John Gillespie, William M. Pagel, Philip Breitmeyer and Edwin Denby.

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CHICAGO, JULY, 1915

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WANTED—A BETTER POLICY

EACH year, just about the time when the automobile world announces its coming year models, the whole public pauses long enough to note the latest developments in general lines and mechanical construction, and especially the selling prices.

Among the gasoline car manufacturers there is a constant tendency to adopt new patterns, with graceful lines, pleasing to look at and truly beautiful.

To the lay public the constantly descending prices each year are likewise of interest, because to many each cut means another step toward the possibility of purchasing.

In the electric vehicle world, the tactics are different; indeed, so entirely unlike those of the successful gas car builders that one cannot avoid the conclusion that electric vehicle manufacturers are continuing methods the gas car people long ago found it necessary to break away from.

Electric car prices, in most cases, continue at exorbitant heights. The prospective purchaser, even though fully educated to the economy and luxury of the electric, waits for an opportunity to invest at a reasonable price—but waits in vain.

So it is but natural that the electric must lie dormant while its more adaptable rival finds the public's eye with a better car at a price that appeals to the average buyer. The electric vehicle manufacturer, on the other hand, finds each year a great obstacle in the selling of his product and "universal adoption" is but a will o'the wisp—a chimera—entertained only by those high-strung imaginations which have survived the disappointments of an extraordinarily conservative policy.

The electric has had its day of education. The world admits its superiority, its economy and its durability. The world likewise recognizes the merits of radium and other rarities beyond its means of securing. What the public waits for and what must absolutely be regulated is a selling price which will give more people a chance to purchase; and in these greater sales will be a more regular profit to the manufacturer on his investment.

Just now we find the electric vehicle industry becoming contaminated with illegitimate sales policies, unreliable guarantees and less carefully constructed cars; all of which automatically develops from the use of impractical methods which the gas car industry discarded long before it could become one of the greatest industries in the world.

We have had ample opportunity to sympathize with those who are either slowly losing ground or have fallen from the road to success. Petty trade secrets, sharp and illegitimate tactics have been laid bare, and the electric, so highly regarded by the few who appreciate quality, cost unconsidered, is burdened with a millstone of business methods that were thrown by the wayside years ago in practically every other industry.

We are waiting patiently for an organization of business men who will further educate the public not to the electric in general but the electric in particular, with a sales policy honest and indiscriminating. The public will not long be influenced by unscrupulous sales talk; it must purchase on facts which it knows are true and reliable. Then, and only then, will the electric be able to prove its true greatness.

CONVENTION COMMENT

NOW that the N. E. L. A. convention is over and the electric vehicle situation has been thoroughly discussed, we hope a new and better era may come for both manufacturers and central stations.

As is always the case, central stations have condemned the high prices of cars and manufacturers the high price of current.

From all reports we again find that that part of the convention devoted to the discussion of the electric vehicle was an arena of keen verbal combat. At any rate the central station as usual is ready to pick up the struggle with still more enthusiasm; and the manufacturer likewise takes a firmer hold on the same tactics he used last year, hoping for greater sales on the newly aroused enthusiasm.

To those central stations in audience not using electrics, all real prospects for at least one vehicle in their own service, the yearly wail of the combatants can have little favorable influence in persuading them to make such an investment.

Although the facts of the situation certainly should be stated clearly in order to secure comprehensive co-operation, it is hardly to be expected that the mutual pessimism displayed will have a salutary effect at a time when optimism should form its first root of ambition in the minds of the uninitiated.

Whatever the outcome of the last convention may be, it is hoped first that many central stations previously lukewarm will investigate the much discussed electric on its own merits, install a vehicle in their service, and give it a thorough test.

GARAGEMEN, DON'T CROWD YOUR VEHICLES

IN RECENT years the increased sale of electrics has introduced a problem which is just beginning to show evidence of trouble, demanding immediate solution. Five years ago in practically any vicinity one could find ample garage space to board an electric properly. Today in the average garage catering to the electric, we find the garagemen hoarding the greatest possible number of vehicles in the space available. As a result, the cars are placed so close to each other that fenders are scratched and mutilated, hub cups badly bent, and running boards injured from slight, but constant collision.

Such abuse in the course of a few months leaves many scars on the highly polished surfaces, which very soon detracts from the general beauty of the vehicle and causes owners to become dissatisfied with the care given their cars. It is far better for a garage owner to set a maximum limit to the number of cars to be boarded in his station than to selfishly find room for "one more," and as a result, lose many of his regular customers.

Those people who buy electrics, buy them for their beauty. The garage man is an important factor in preserving this beauty and general appearance.

COMBINING FOR GREATER PRODUCTION.

WHEN the Baker Motor Vehicle Company and the Rauch and Lang Carriage Company, two of the largest and oldest electric car manufacturers in the United States, announced their recent merger, the electric vehicle industry paused in its regular routine of business cares long enough to wonder just what development was going to take place and what effect it would have on the industry as a whole.

ELECTRIC VEHICLES has long anticipated a new era in the electric car industry. The old, shopworn

methods of small-scale production and profits; inflated overhead expense resulting from keen competition in a seemingly limited field; avoidance of advertising campaigns, and a general lack of regular selling tactics have long worked to undermine the industry.

Practically every electric car manufacturer in the industry has been taking the line of least resistance, satisfied with a comfortable revenue from a few sales at a big price.

Today we find the beginning of what we believe to be a new era in this splendid industry which has been practically trodden into the ground through poor judgment.

Legitimate manufacture, a combination of products which are worthy of the industry's approval to be built at a minimum expense because of quantity production, will we hope through immediate success stamp the electric in the minds of the public.

Then will our remaining manufacturers find it necessary to get down to the business of manufacturing and selling according to those principles which the gas car manufacturer and every other manufacturer have found to be the only road to success.

The close of the year 1916 will find a much different status of affairs. The \$1,000 electric will not be a mere dream; on the contrary it will be on the market to thousands who had never previously associated its possession with their ambitions.

Then shall competition be keen not from its present angle of sustenance but more so from the angle of leadership and record production. And even in that day a success in the electric car industry will only be a repetition of the gas car industry's history, which long struggled in a similar rut of irresponsibility.

PARKING SHOPPERS' ELECTRICS.

IN many of our larger cities where the electric vehicle is used in great numbers for shopping, the question of "parking" is becoming a serious problem.

In practically every city the large department stores are centrally located which signifies, of course, in the heart of congested traffic.

It is hardly to be expected that any municipality should allow vehicles to park at the curb. And further, a remedy is hardly to be expected from city officials.

The remedy, however, must be obtained else the "popular electric for shopping" will have lost its effect as a worthy slogan. The attended vehicle will then have exclusive rights and many who now enjoy the pleasure of driving their own vehicles will find much inconvenience.

From every angle the remedy should come from the department stores. A parking system can be inaugurated if the department stores will. A reasonable fee could be made, our lady shoppers could still shop "via electric" and the driver, the departmentier and the industry would profit immensely.

Every garageman and every factor in the electric vehicle industry should take special effort in promoting a parking system. It means a greater success for every interest; increased sales and greater popularity for this type vehicle.

In Chicago a movement is on foot to induce the large retailers to consider such a system. If the true condition was forced emphatically upon the large retailers, without a doubt immediate steps would be taken to establish a satisfactory system.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

FOLLOWING is a review of the activities of the Electric Vehicle Association of America as prepared by the secretary.

A council meeting of the association was held on Friday, June 25, at which time President John F. Gilchrist, Treasurer H. M. Edwards and Messrs. W. C. Andrews of the Edison Storage Battery Company, Joseph F. Becker of the United Electric Light and Power Company, who attended the meeting for Frank W. Smith; Charles Blizard of the Electric Storage Battery Company, E. P. Chalfant, secretary of the Electric Automobile Manufacturers' Association; W. A. Donkin of the Duquesne Light Company, W. C. Johnson of the Waverley Company, George H. Kelly of the Baker Rauch and Lang Company, E. S. Mansfield of the Edison Electric Illuminating Company of Boston, C. A. Poyer of the Edison Storage Battery Company, who attended for W. G. Bee, Harvey Robinson of the New York Edison Company, P. D. Wagoner of the General Vehicle Company, were present.

A letter from Samuel Scovil, president of the Cleveland Electric Illuminating Company, to President John F. Gilchrist, was read, in which Mr. Scovil invites the association to hold its 1915 convention in Cleveland. Mr. Scovil's appreciated invitation was unanimously accepted by the council, but the exact dates on which the convention will be held is a matter yet to be determined upon and will be released as soon as possible.

Particularly interesting was the presentation of two petitions for sections, one from Kansas City, Mo., and another from Portland, Ore., which Secretary Marshall secured on his recent trip. This increases the section representation to sixteen (16) in as many cities, namely, New England, Chicago, Philadelphia, Washington, Cincinnati, San Francisco, Los Angeles, Pittsburgh, New York, Detroit, Cleveland, Toronto, Denver, St. Louis, Kansas City, and Portland, Ore.

It is gratifying to note that about a year or so ago, the association had but two sections in New Eng-

land and Chicago, with a membership of something less than five hundred (500), whereas today, the membership is 1,058, with 16 sections.

Follows a membership report as presented at the council meeting, showing section and membership classification.

ELECTRIC VEHICLE ASSOCIATION OF AMERICA. Membership—June 25, 1915.

	Active	Associate	Auxiliary	Press	Total
	Active	Associate	Auxiliary	Press	Total
	C S Mfrs.	C S Mfrs.			
February Report....	104	33	820	12	999
Resignations .....	..	10	31	..	42
Pending	104	23	789	12	957
Applications	2	1	91	..	95
Pending	106	24	880	12	1,052
Total Members ..	130	880	12	30	1,052
NEW ENGLAND					
February Report....	32	2	86	1	122
Application .....	..	..	1	..	1
Total Members ...	34	87	1	1	123
CHICAGO					
February Report...	5	5	118	1	134
Transfer .....	..	..	2	..	2
Resignations	5	5	116	1	132
Pending .....	..	3	2	..	5
Pending	5	2	114	1	127
Applications .....	..	..	17	..	17
Pending	5	2	131	1	144
Total Members....	7	131	1	5	144
PHILADELPHIA					
February Report ..	2	3	67	1	74
Resignations .....	..	..	4	..	4
Pending	2	3	63	1	70
Applications .....	..	..	6	..	6
Pending	2	3	69	1	76
Total Members...	5	69	1	1	76



G. M. C. Electrics Are Easily Operated in Congested Districts.



Mrs. S. Dreyfus, Manhattan, New York, in Her Rauch & Lang.

WASHINGTON					
February Report...	1	..	42	..	43
Resignations .....	..	..	3	..	3
Pending	1	..	39	..	40
Applications .....	..	..	2	..	2
Pending	1	..	41	..	42
Total Members...	1	..	41	..	42
CINCINNATI					
February Report...	1	..	12	..	13
Applications .....	..	..	4	..	4
Pending	1	..	16	..	17
Total Members...	1	..	16	..	17
SAN FRANCISCO					
February Report...	1	..	19	..	21
Total Members ..	1	..	19	..	21
LOS ANGELES					
February Report...	5	..	57	..	62
Resignations .....	..	..	1	..	1
Pending	5	..	56	..	61
Total Members...	5	..	56	..	61
PITTSBURGH					
February Report...	1	1	26	..	29
Total Members...	2	..	26	..	29
NEW YORK					
February Report...	8	8	197	4	235
Resignations .....	..	1	17	..	19
Pending	8	7	180	4	216
Applications .....	..	1	17	..	18
Pending	8	8	197	4	234
Total Members...	16	..	197	4	234
DETROIT					
February Report...	2	3	45	..	50
Resignation .....	..	1	..	..	1
Pending .....	..	..	45	..	49
Applications .....	..	2	1	..	1
Pending	2	2	46	..	50
Total Members...	4	..	46	..	50
CLEVELAND					
February Report...	..	3	24	1	28
Resignation .....	..	1	..	..	1
Pending .....	..	2	24	1	27
Applications .....	..	..	3	..	3
Pending .....	..	2	27	1	30
Total Members ..	..	2	27	1	30
TORONTO					
February Report...	2	1	14	..	18
Total Members...	3	..	14	..	18
DENVER					
February Report...	1	..	18	..	19
Resignation .....	..	..	1	..	1
Pending	1	..	17	..	18
Total Members...	1	..	17	..	18
ST. LOUIS					
February Report...	1	1	25	..	27
Transfer .....	..	..	1	..	1
Pending	1	1	26	..	28
Registrations .....	..	..	2	..	2
Pending	1	1	24	..	26
Applications .....	..	..	6	..	6
Pending	1	1	30	..	32
Total Members...	2	..	30	..	32

PORTLAND						
February Report...	1	..	3	..	..	4
Applications .....	..	..	11	..	..	11
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Pending	1	..	14	..	..	15
Total Members...	1		14	..	..	15
KANSAS CITY						
February Report...	..	..	3	..	..	3
Applications	1	..	11	..	..	12
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Pending	1	..	14	..	..	15
Total Members...	1		14	..	..	15
MEMBERS AT LARGE						
February Report..	41	6	64	4	2	117
Resignations .....	..	4	1	..	..	5
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Pending	41	2	63	4	2	112
Applications .....	..	..	7	..	..	7
	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>	<hr/>
Pending	41	2	70	4	2	119
Total Members...	43		70	4	2	119



Mrs. E. F. Van Note, Brooklyn, and her 1915 "Detroit."

Inasmuch as the summer season is here, a great many of the sections have curtailed activities until the fall.

CHICAGO SECTION.

On May 18 the Chicago section held a meeting at the Hotel Metropole, Chairman W. J. McDowell presiding. F. A. Phillips, the speaker of the day, was introduced and gave a short, but excellent talk, on "Organization, Journalism, and the Power Wagon." The situation was very well set forth by Mr. Phillips and considerable discussion ensued. This address appeared in the June issue of *ELECTRIC VEHICLES*.

On May 25, at which time F. E. McCall, secretary, presided, William H. Noble of the Lincoln Electric Company read an excellent paper, illustrated by black-board notations, on "Charging Electric Vehicle Batteries from High Potential Circuits." The speaker elaborated considerably on the loss that would occur from low number of cells per charge on ordinary voltage circuits or where normal size vehicle batteries were charged from higher than ordinary potential circuits, and where the amount of current needed was regulated by means of a rheostat. He also called attention to the fact that it might prove economical to use balancer sets. The subject proved to be one to

which the majority had given little thought and evoked considerable discussion.

An executive committee meeting of the Chicago section was held on May 28 in the office of Secretary F. E. McCall, at which time reports of the section committees were presented and general affairs of the section discussed.

F. E. McCall presided at the June 1 meeting of the Chicago section held at the Hotel Metropole. As there was no program scheduled for this meeting, topics of general interest were called for and discussed. The question of a coming field day was taken up. The discussion which followed indicated that the opinion of those present was to have an affair similar to the one held last year. This event was held indoors and a supper was participated in, after which the attractions of the evening were pool and quite an extensive bowling tournament.

Mr. Meyer of the Timken Bearing Works of Detroit was to have been the speaker at the June 8 meeting, but was unfortunately detained and could not attend. Consequently, the time was given over to other timely matters. Chairman McDowell told about the bill board truck advertising scheme being postponed until the fall.

NEW YORK SECTION.

The May 25 meeting of the New York section was held in the auditorium of the Consolidated Gas Company building. Harvey Robinson, chairman, presided, and announced that the program for the evening would be a series of talks on charging apparatus.

David F. Tobias, secretary, stated that the papers committee had been endeavoring to obtain papers which would be of general interest and along definite lines of work connected with the electric vehicle industry in general. For this meeting the committee selected a program of more practical nature, that is, more technical than those previous. It was felt that to select any one type of apparatus would not be discussed. Invitations were sent to manufacturers of charging apparatus of all types to send representatives to tell the good and bad features of their apparatus. Several of them attended, prepared to address the meeting and most of them had lantern slides.

The first gentleman called upon was D. J. Burns of the Ward-Leonard Company, who read a paper prepared by Mr. Waller.

The second speaker, J. J. Kline, of the Fort Wayne Works of the General Electric Company, described the features of his apparatus, nine or ten slides of which were thrown on the screen. S. C. Harris asked what success the Fort Wayne Works had been having with charging batteries by the constant potential system. Mr. Kline replied that they had marked success. There have been many recent installations but they have not been in operation long enough to obtain any statement of results. Garages favor it to some extent. They seem to be very well pleased at getting an 80 per cent charge in three and one-half hours.

One member inquired whether the fuses in the standard board were air fuses. The speaker replied that they were standard underwriters' fuses, regular N. E. C. Mr. Harris inquired as to the details of the finish of the charge regarding current not dropping as low as it should and causing increased heat in the battery. Mr. Kline was not prepared to give details on the condition of the battery from their experience

but knew that his factory superintendent had been charging his own individual car on the constant potential method for a great many months, and while his car was looked over by the men who have charge of their trucks, was very well pleased with the service under this method. G. B. di Moise of the Westinghouse Electric & Manufacturing Company presented some slides showing motor generator sets and rectifiers and explained their characteristics.

E. T. Foote of the Cutler-Hammer Company confined his talk to the one type of charging apparatus for public garages and small and large fleets.

F. W. Eller of the Electric Products Company described some motor generator sets, and after similar talks by E. D. Pike of the Wagner Electric Manufacturing Company and E. B. Forslund of Chicago, the meeting adjourned.

DENVER SECTION.

Denver section held a meeting on June 22 at the Hotel Metropole, at which E. M. Jackson, chairman, presided. "The Electric Automobile Motor," by H. S. Baldwin, as presented at the last convention, was reviewed and discussed.

It was suggested by Messrs. Davis and Bruckman that the Denver section inaugurate some kind of an electric vehicle run that would tend to stimulate the electric vehicle industry. They suggested that a trip be taken up Lookout Mountain, which is undoubtedly one of the grandest trips in the world. With a view to making the trip possible for all kinds and makes of cars, it was suggested that suitable charging apparatus be temporarily installed in Golden, at the base of Lookout Mountain, where the party could rest for lunch and in the meantime, all the cars could be given a very substantial "boost." It was announced that a prominent moving picture concern would be glad to take a moving picture of the trip and these pictures would afterwards appear all over the country in their "Current Event" films, thus advocating the use of the electric and demonstrating the possibilities of type of car in mountain climbing. Several members of the section have previously made this trip with comparative ease and after making the descent have turned around and repeated the trip. The cars used in these trips were ordinary cars and one was not even considered standard make. In order to ascertain the possibilities of making this run and perfecting arrangements for the "boosting" facilities, a committee of five was appointed, and upon a satisfactory report from them to the section, the event will be made official.

SECRETARY'S WESTERN TRIP.

The Electric Vehicle Association has been extremely fortunate in having the sustained, hearty, and valued co-operation of the National Electric Light Association, the secretaries of the two associations working in very close harmony, and when the occasion is required it has been customary for co-operative committees to be appointed by the two associations to promote any particular development.

Some few months ago the opportunity was afforded President Gilchrist and Secretary Marshall of the Electric Vehicle Association to develop for presentation at the thirty-eighth convention of the National Electric Light Association Convention, which was held in San Francisco June 7-11, a paper, "The Electric Vehicle and the Central Station." This paper was presented by Secretary Marshall.

The Motor Truck and Why

A Paper Presented at the National Team Owners Assn. Convention

MOTOR trucks are of three kinds: light delivery vehicles, from 500 pounds to 1½ tons in capacity; medium-sized trucks, from 1 ton to 2½ tons in capacity; and heavy trucks, from 3 tons to 6 tons or more. There are also tractors and trailers from 7 tons up to 30 tons in capacity.

Teaming and draying companies, warehouse and storage firms, and express and transfer concerns have made heavy investments in motor equipment.

You have seen motor trucks introduced. You have seen them grow in favor, and although in isolated instances you have witnessed the abandonment of motor trucks, the fact of the constantly-increasing numbers of repeat orders, especially from the larger and more successful of the transfer and storage companies, must have impressed you.

That these concerns indorse and continue to use motor trucks must have borne into your minds the impression that motor truck failures cannot have arisen wholly from the lack of reliability of commercial motor vehicles or from their inability to do hauling as cheaply as horses or mules. In other words, if you have looked around you at all, if you have analyzed your own experience candidly, you must have come to the conclusion that whether or not a motor truck is successful must depend upon how it is used.

Now for a motor truck to be used properly it must be applied to work where it is adapted, and with a proper application for a motor vehicle and a knowledge of how to use it efficiently, so as to get the most out of it for the least expenditure in the long run, it is logically essential that the right unit be chosen in the first place.

WHAT A BUYER SHOULD KNOW.

Then there must be three factors for consideration:

1. What type and capacity is needed?
2. What class of work can be efficiently done with motor trucks?
3. What is the manner of operation which will net the greatest return for the money spent upon the vehicle and its maintenance?

These questions are not to be answered by any form of snap-judgment; they require real, earnest study, by persons qualified by knowledge and experience to make the proper analysis and recommendation. But it is not an impossible task or one requiring any greater genius than wholesome common sense. That these problems have been and are being solved is

borne out strongly by the fact that

in the past two years, two team owners' associations have changed their names to team and truck owners' associations, or similar cognomens, indicating that there were sufficient truck owners in the body to warrant it in extending its activities to consideration of motor truck as well as horse problems.

Your national organ has devoted a large portion of its pages to motor truck subjects, and recently, following the lead of several of the affiliated associations, has struck out the horse word, Team, from its name.

HORSE STILL HAS A FIELD.

You all have very good friends and close connections amid the horse interests, and your experience has shown you, perhaps, that there are some fields in which the motor truck has not yet demonstrated its economy over animal power. I am not here to advise you gentlemen to sell all of your horses to the French, English and Russian war buyers and buy motor trucks instead

—if this war keeps up horseflesh will be a better investment than American Tobacco preferred—I am here to point out the respective fields of the horse and the motor truck and to urge you to confine the use of horses to fields in which they are efficient, applying motor trucks to all lines of work in which they are more efficient than horses.

I am here to warn you against the snags in the course of truck use which have mired many a promising concern because of its failure to grasp the fundamentals essential to truck success.

One premise you must grant, namely, that the horse will eventually be practically supplanted by motor vehicles of one kind or another. You cannot avoid it, and when the time comes you will not want to. You will welcome the time when the faithful horse is finally led from the traces to his last rest.

THE MOTOR AGE IS INEVITABLE.

Here are the reasons:

1. Economic conditions: Land values are constantly rising, and it becomes increasingly expensive to raise horsefeed and to breed draft animals. *Collier's* for January 9, 1915, is authority for the statement as follows:

The horse's average consumption of food is 10 pounds for every hour that he works, or a total of 12,000 to 14,000 pounds per year, which is the average production of 5 acres of agricultural land in the United States.

The economic waste resulting from the feeding of 25,000,000 horses (and mules) in the United States, taking the Government's estimate that one horse requires 5 acres of land for his



A Baker Electric Operating in Tokio.

up-keep, and the known fact that 5 acres of land devoted to food products can be made to feed five people per year, we have an acreage sufficient to feed 125,000,000 people that is now being devoted to the growing of horse feed alone.

The proportion of meat animals to the population has steadily decreased since 1850. According to Farmers' Bulletin No. 575, issued by the U. S. Department of Agriculture, in 1850 there was .88 cattle to one human in this country, as against .57 in 1914. This means that for every 100 people in 1850 there were 88 cattle. Today there are but 57 for every 100—naturally beef is higher. That it is not 31 per cent higher is due to more efficient methods of manufacture. Swine have decreased from 154 to every 100 people to 60 to every 100; sheep from 113 to 50. Today there are 26 horses to every 100 people. This acreage turned over to beef, pork or mutton production would greatly reduce the cost of meat by increasing the acreage available for the raising of the animals.

HORSES GETTING DEARER—TRUCKS CHEAPER.

2. Economy of haulage: It is a known fact that the prices for horses are constantly rising, while those for motor trucks are getting lower every year. There is no limit to the possible production of motor vehicles, but, as above indicated, there is a very definite limit to the production of horses, and their value must increase irrespective of quantity of production. Land values have doubled in the first fourteen years of this century with no territorial expansion in the United States proper. With an immigration of over a million a year, there is every reason to believe that land values will continue to increase, and as each horse depends upon five acres of land to support him, the increase in value of these acres surely will increase his cost of living.

Motor trucks are made from materials that do not increase in value very much, from year to year. All of the principal parts are made from easily-obtained materials, and the cost of production depends to a great extent upon its volume.

Mechanical improvements are reducing the cost of repair and adjustment greatly, while the increasing prevalence of horse diseases, such as glanders, azoturia and others, are constantly increasing the horse's veterinary cost.

The average list price of American motor trucks of all capacities has decreased \$393.11 in 3 years since 1913, or about 12 per cent. Horses in New York State in that time have increased \$8 per head in price; in New Jersey, \$10 per head; in Pennsylvania, \$6 per head, and in Massachusetts, \$15 per head, a percentage of from $4\frac{1}{2}$ to $10\frac{1}{4}$ per cent; so you see motor trucks are getting cheaper in even greater ratio, year by year, than horses are getting dearer. It is easy to see that the causes of these changes in values are fundamental and not likely to change, so that the time cannot be far distant when motor trucks will be so much cheaper than horses that you gentlemen will have to resort to gasoline fuel instead of hay in spite of yourselves.

WHAT WILL THE WAR DO?

3. The war: The present war is going to have a greater bearing on the horse supply of this country than is generally thought. The first four months of the war, 75,000 horses were shipped out of this country for military buyers abroad, according to the U. S. Bureau of Animal Industry of the Department of Agriculture, or only .3 of 1 per cent of the total we have. But this does not warrant the hasty conclusion that

the horse wastage of this war will be negligible. European buyers would not come to the United States and Western Canada at all if their home supplies were not inadequate. The breeding centers of the world for draft horses are in northern France, in Normandy, and in Belgium, also in England and Scotland. The stables in Continental Europe have been burned and the horses sent to the battlefields. In England the supply of animals has been depleted, and remember, it takes 5 years to raise a horse after you have bred him—and 50 years to develop a breed from wild or mongrel stock.

Of course, we in America have a plentiful supply of high-class stallions and a goodly sprinkling of pure-bred brood mares, but no more than we need. We do not depend upon a home supply for breeding stock. Our pure-bred animals are mainly stallions, and our draft horses are principally bred from grade mares. Remember that the high quality of a draft breed must depend upon the amount of pure blood in the animals to retain the desirable features, and the amount of pure breeding that can be done depends upon the supply of pure-bred mares. We have no such supply here, and now Europe lacks it.

Horses, therefore, are not only going to be more expensive to keep and raise, but they are going to be more scarce, and worse than all this, of poorer quality than that to which we are used.

TRUCK SOLUTION OF TRAFFIC PROBLEM.

5. Street congestion: Unfortunately, our forefathers never dreamed that the United States would grow and prosper as it has, and yet we are forced to do business in the cities whose narrow lanes were the widest that these old sires could conceive of being necessary. Modern commerce has grown faster than our cities and long-haul transit, railroads and steamships have developed possibilities for overland transportation far ahead of the available means for moving it over the short hauls from thence to the marts of trade, so that the traffic problem becomes more acute daily.

Our streets are nearly all too narrow; but they cannot be widened. Our terminals are too small, too crowded and too antiquated. We can change the latter, but we cannot relocate them or make them larger. Our trains move faster and carry larger loads constantly, so do the great ships; but the increased volume of freight thus moved has to pass through the same terminals and over the same streets as our great-grandfathers used.

If we continue to use present methods much longer, traffic will become so congested that it will be impossible for vehicles to move at all. The only remedy is either to reduce our population, and therefore the volume of our commerce, or to improve our traffic methods, so that we can move an increasing volume of freight traffic with a decreasing amount of congestion. There are but two ways in which to move a greater amount of matter through a passage of inextensible size: by moving it faster, or if it is not in fluid form, in larger units.

TAKE YOUR OWN MEDICINE.

You have perceived the mote in your brother railroad carrier's eye, but you have not plucked the beam from your own. You have pointed out the appalling inefficiency of our freight terminals, and evolved a means of speeding up operations with reduction of



Operating Costs of These General Vehicle Electrics Have Proven That for Haulage Between Freight Terminals the Electric is the Economical and Reliable Type.

congestion. You have advised tailboard delivery and receipt of freight, simpler clerical operations, and electric industrial trucks within the freight houses instead of the slow, costly and congestion-causing hand trucks.

Turn your attention now to your own situation. You are the common carriers of the city. You are to the retail deliverymen and to the citizens of the city what the railroads are to you and the merchants who hire your service. The railroads have delayed your traffic by their inefficient methods—just as you are congesting the city streets when you operate horse vehicles where motor trucks would haul larger loads at greater speed, and at less cost, thus decreasing both the street congestion and the cost of your service.

THE CITY HORSE AND PUBLIC HEALTH.

6. Sanitation: I have left this reason to the last because it has no direct bearing on anybody's pocket-book, unless we consider the fact that most of our worst diseases are maladies of filth, and that the most prevalent filth, in cities at least, is horse filth; unless we take into account the enormous cost of cleaning this litter from our streets, and the toll in human life and suffering, as well as doctors' bills that result from filth diseases.

I know that these reasons will never, by themselves, cause horse owners to trade their animals for machines, but I do believe that eventually the boards of health, when it has been demonstrated that the horse is not only an evil but an unnecessary evil, will banish draft animals from our crowded cities, as they practically have done with cows and chickens.

So you see that is the way it lines up when you begin to look beneath the surface of things. But do not mistake me that I look for this state of things to come to pass immediately—right after the war, as some seem to believe. It will be accelerated by the war, beyond a doubt; for one thing, the fields of the world will be so much in demand to raise food for starving nations and to refill the empty granaries that the horse's full nose-bag will for some time to come be an equine dream.

What I have tried to sketch is the development of perhaps another generation, half a century, even, al-

though with the accelerated rate of progress which we have all had cause to note. I might venture the opinion that most of us here would live to see the motor millenium.

MOTOR MILLENIUM DRAWING NEAR.

Today is what counts, though, for on what we do today depend our actions tomorrow. Today even the ox-cart has not been displaced by the horse, as yet. In Ceylon the intermediate horse stage is being side-stepped and they are going directly from oxen to motor trucks. For the present the horse has a place, duties to perform which man has not yet found mechanical means of doing more cheaply.

The present types of motor trucks are displacing and will continue to displace large numbers of horses in commercial fields, and the electric is going further than the gasoline vehicle into the exclusive precincts of horses. But our present vehicles cannot run the whole gamut of transportation uses. When new types, much cheaper than it appears present types can be built, and probably slower, the horse will cease to be a necessity.

Present traffic conditions will have to be changed. Horses will always be used at the congested freight terminals until the I. C. C. forces the railroads to install tailboard delivery and receipt with electric stevedores instead of hand trucks. Not till then will it be worth while to try to apply commercial vehicles to dock haulage. Until then, keep your horses on the freight terminal runs if you live in a large city.

SHORT HAULS AND LONG HAULS.

There is no argument, among informed persons, about the effectiveness of the truck on long hauls. That is why so many users of trucks still cling to horses. They use the trucks for long hauls and the horses for short hauls. That is right, provided the long hauls are not too short, or the short hauls not too long. There is a fairly definite dividing line, which differs in varied installations, but in most cases where mixed equipments are maintained, the horse is given the benefit of the doubt and the truck used only where the hauls are of such length as to leave no question about the economy of using trucks on them.

Those who do not have trucks naturally use horses for the whole range of hauls.

Roughly speaking, the types of vehicles best adapted to commercial hauling may be apportioned as to zones. The first zone, which is of small radius and usually in the most congested portion of the city, is the horse's domain. Within this zone, except under exceptional conditions, no motor truck will pay. Outside of this zone is the electric's own little territory. At this radius it will do the hauling cheaper, and of course more satisfactorily than a horse wagon, but the hauls are still too restricted for the efficient and economical operation of a gasoline truck. Along the outer rim of the electric zone the gasoline vehicle will show greater economy than the horse wagon, but the electric will beat them both. Outside of the electric's zone is the exclusive zone of the gasoline vehicle, in which class the steamer, of course, ought to be included.

There are two kinds of short hauls: those which are inherently short, which cannot be lengthened, and those which are short because of arrangement of the routes. Long delays in loading and unloading shorten a route very definitely.

When the motor truck takes the place of the horse wagon entirely it will be when truck manufacturers learn how to build low-priced trucks which can operate economically within the horse radius, or when horses become so expensive that present types at lower prices can compete with them; and when truck users learn enough about the value of time and efficiency of motions to so reduce loading delays that big mileage will be possible on short hauls. The two outer zones will then contract so that the inner circle will disappear entirely—that will be the motor millenium.

Now, then, why must the present type of gasoline vehicle have what I have called long hauls, and why may the electric have hauls longer than the horse, and yet operate economically on shorter hauls than the gasoline truck of similar capacity; and also, why may not the horse operate efficiently on long hauls?

What I mean by haul is not necessarily the distance from the loading point to the unloading point, or the first delivery point, but rather the mileage that the vehicle makes in the necessary travel in the working hours of the day.

A motor truck costs so much per day to run. Most of this cost is fixed, and goes on just the same whether the truck is moving or not. The man who first got out that story about a truck costing nothing when it was idle did more harm than he will ever know. Its cost increases *with* its mileage, but nothing like in *proportion* to its mileage. In other words, the more miles you get out of your truck each day—that is, useful miles—the less it will cost you—per mile.

This would also be true of a horse, were it not for the unfortunate fact that a horse, being animate, tires, and cannot keep working at a given rate, hour after hour. He must stop frequently for breath, to cool off, to rest his aching muscles, to ease his chafed shoulders. Give him all the opportunity in the world and he will not haul a load farther than a certain number of miles a day. After that he is liable to lie down and quit. If you do push him to his limit of endurance, the last few miles will be very hard miles to make, and the driver will be working almost as hard as the horse.

Further, a horse cannot pull his load at so great a speed as a truck, hence it cannot go so far in a given length of time.

MAKING THE MOTOR TRUCK PAY.

A truck costs more to run than a horse. It costs more to build, and to buy. You must, or should, have a higher-priced man on its seat, and so to pay the expense of its operation you have to do more work with it in a day to correspond with its increased cost. If it does less work in proportion to its cost than to the horse's cost it is an extravagance; if more, an economy. There are two ways in which it may be made to do more work:

1. Take the same load more miles in a day.
2. Run the same miles with a greater load.

If the haul is fixed, and the weight of each load is fixed, the truck must make a greater number of trips per day—it must depend upon its speed.

If the length of haul and the possible speed are restricted, the truck must be able to carry a greater load.

Suppose, for example, a motor truck costs twice as much as a horse wagon per day, disregarding the difference in cost due to varied mileages, and that the horse wagon is making 4 trips per day over a certain route with a certain load. For the truck to pay it must make 8 trips with the same load, over the same route, in the same time, or 4 trips over a route twice as long with the same load in the same time, or 4 trips with twice the load over the same route, or equivalents thereof.

At that rate it will do the same work as two horse wagons at exactly the same cost. If it does more work it will be cheaper than any combination of horses.

But right here is the difficulty. Suppose the load cannot be increased, and the length of each trip is fixed. The only way in which the truck can justify its employment is by doubling the horse trips. Loading conditions permitting, this is easily possible, for the truck can keep going every minute of 10 hours, if need be, and can double the horse speed; but loading conditions do not always permit.

In such a case, it follows that unless the loading time can be cut down, the truck will not be a success. But, if you are going to cut down the loading time for the truck, why not for the horse, too?

THE FACTOR OF FATIGUE.

Because it cannot run as far in 10 hours as the truck. It cannot run as far, as fast or as continuously. The advantage of the truck is that *it has cut out the factor of fatigue*. A horse might for a brief instant equal the truck in speed; but it could only sustain this speed for minutes, while the truck can keep going at that speed for hours.

A horse in heavy trucking can run 15 miles a day, and serve a long and efficient life—5 years from date of purchase, I believe it is, so that he dies at the age of 8, or at least degenerates into less active service. He can haul, with his team-mate, 5 tons of goods over metropolitan streets, at 3 miles per hour, average moving speed.

This means that he can draw a load for 5 hours, all told, although if he tried to do it all at once without stopping it would not be good for him. This leaves another 5 hours which he must spend in standing, in loading and unloading, etc. So wise horse operators so arrange their horses' working day that their moving time and standing time is evenly distributed throughout the day.

If the hauls are so long that the horse must walk steadily for several hours, he will not work as efficiently as though he only had to walk an hour or less before having another rest. A horse works best at an easy, placid amble, with frequent stops of sufficient duration

to get his breath and dry off under the harness. He must only travel 15 miles a day, anyway, and he has 10 hours to do it in, so speed of loading gets him nowhere, for if his driver knows what he is about he will see that he spends all of his day in making that 15 miles.

A similar condition exists with the lighter loads, such as heavy expressing, where the horse will make 5 or 6 miles per hour and go from 18 to 20 miles per day; and the light delivery horse who will make 7 or 8 miles an hour and travel 25 to 28 miles a day.

For each of these classes of horse there is a truck of similar capacity, or perhaps slightly more, which will *double* the horse speed and travel *all day long* without getting tired.

FOR EXAMPLE.

To illustrate more plainly the importance of reducing the standing time of a motor truck in order to achieve its utmost efficiency, suppose a team to be capable of 15 miles a day, a speed of 3 miles per hour, and a load of 5 tons. Suppose it is working over a haul of $1\frac{1}{2}$ miles each way, or 3 miles round trip. In a 10-hour day it will make five trips, 5 hours will be spent in moving and 5 hours in loading and unloading, averaging 30 minutes for each operation of loading and of unloading. Under these conditions, each trip will take 2 hours, 1 hour loading and unloading and 1 hour moving.

Now a 5-ton truck, going 9 miles per hour, can make the 3-mile round trip in 20 minutes. Under the same loading and unloading conditions, it will make each trip in 1 hour 20 minutes, so that in 10 hours it will make seven trips, taking 9 hours and 10 minutes, the remaining 50 minutes being too short a time for a whole trip. It is obvious that, assuming the truck to cost twice as much per day as the horse wagon, that seven trips for the truck as against the horses' five will make the cost by truck more than by horses, so that under these conditions the truck will not pay.

To pay, the truck must do the same work at the same cost, or less, so the problem is how to make the truck complete *three* more trips in the 10 hours.

Suppose that it is possible to cut 10 minutes from the operations of loading and unloading. This would mean 20 minutes from the trip time of the truck, leaving 1 hour to make the entire round trip. At this rate the truck will make ten trips per day, reducing the cost per trip to the same figure as for horses.

THE HORSE PACE.

Now, as it is well known that the loading and unloading time for horse vehicles is longer than absolutely essential, for the reason that long waits such as extend the horse working day to a full 10 hours conserve the energy of a horse, and do not detract from his efficiency because of his limited mileage capacity, it is very likely that in most instances such a saving of loading and unloading time could easily be effected. Such has been my observation.

There are cases, of course, where the loading and unloading time cannot be decreased; where 1 hour average standing time per trip is essential—you are lucky, sometimes, if you get off that easy at the freight terminals of North River, New York, Market street, Philadelphia, or Atlantic avenue, Boston—but not always, nor in the majority of cases, I believe.

Horsemen get used to the horse pace of doing things, and begin to think it is necessary for a loader to spit on his hands, hitch his trousers and heave a deep sigh every time he puts his hands to a box. I have often thought what an economy it would be if some truckmen

would buy their teamsters each a good pair of suspenders now and then to save the time that seems to be necessary for him to keep his trousers on without them.

It never occurred to some men that a \$10 roller chute on their unloading platforms might save hundreds of dollars in murdered minutes in the course of a year; that a side-door in a truck might save years of time.

COST FIGURES AND GUESSWORK

Another thing. How many truck users really *know* whether trucks pay or do not pay? You can't judge by snap-judgment. You must rely on figures. Not on the sort you scribble on the edge of your blotting pad on your desk, but the sort that are kept in books or on cost and performance sheets. You cannot tell by the ledger alone, especially if half the items that should be charged are left out and a lot of others put in where they don't belong. You must know, first of all, how much work your vehicles are doing, and then be able to compare the costs of both horses and trucks with their respective performances.

You have heard the statement over and over again: You have got to come to trucks, sooner or later. With some of you it will be later; you will wait until horse costs go up and truck costs go down until you are forced to the conclusion that trucks are cheaper, or your competitor begins taking your business away by giving better service via truck than you can with your horses. With others it will be sooner; when you realize that today, under present conditions, by applying a little thought and study to your loading and unloading, routing and dispatching arrangements, so as to give the truck a show, you will be able to do your hauling faster, more reliably, more cleanly and more cheaply.

Rudge-Whitworth Wire Wheels for Electrics

"A question that is occasionally asked me," said H. L. Dunbar, Chicago agent of the Rudge-Whitworth wire wheel, "is, 'How long do your wheels last in the racing game?'" This question was answered by L. C. Erbes, manager for Bob Burman. He stated that the same wheels have been used on the Peugeot which Bob drives, ever since it has been in this country. He doesn't know how long they were used before that time. The car has been through three 500-mile speedway races and many other shorter ones.

The remarkable superiority of wire wheels is recognized by the race drivers, as was demonstrated by the number of them that were used both at the Indianapolis and Chicago speedways. In the former, twenty-eight out of forty-one cars entered were equipped with Rudge-Whitworth wire wheels. The prize winners using them finished first, second, fifth, sixth, eighth and tenth, making six out of ten winners.

At Chicago the showing was even better. There were thirty cars entered. Twenty-three of these were equipped with Rudge-Whitworth wire wheels. Of those finishing "in the money" were: First, Resta; second, Porporato; fifth, Grant; seventh, Chevrolet; eighth, Burman; ninth, Alley, and tenth, Cooper. This makes seven out of ten winners.

The wire wheel, as demonstrated on gasoline racing cars, has proven its durability and tensile strength.

Electric vehicle owners invariably demand the best possible equipment, insuring first, safety, and secondly, durability.

It is predicted that practically every electric vehicle manufacturer will equip all 1916 models with the popular wire wheel.

Electrics for Teaming and Deposit Companies

Motor Vehicles Allow Greater Extension of Business Area

THE day of the teamster has nearly passed. Ten years ago the teamster sat behind a fine span of plump horses and took a special pride in his equipment. Today the few remaining teamsters drive close to the curb and look with much envy upon their former acquaintances at the steering wheels of rapidly moving motor trucks.

The motor truck era has practically included every business having a delivery problem. Teamsters, the hinge on which all freight transportation depends, are likewise rapidly falling in line in the universal acceptance of the motor truck. Although the very existence of this industry was made possible by the horse, today we find the greater bulk of matter transported by motor trucks.

Warehouses, safe deposit vaults, furniture and piano movers, and teaming companies of every nature, have found that the motor truck gives quicker service, thereby allowing the transportation of a greater volume of matter, which represents, of course, a greater revenue pro rata.

In this new development the electric battery propelled type has figured prominently, for instance, the Manhattan Storage & Warehouse Company, conceded to be the largest concern of its kind in New York City, and one of the biggest in the country, is gradually replacing all of its horse-drawn delivery equipment with motor vehicles.

Although the company has comparatively made only a beginning in the work, the clear, concise ideas of its president, with reference to its attitude toward motor vehicles, are extremely interesting, replete with definite information for the actual or prospective user of the motor truck.

According to G. L. Wells, the Manhattan Company's president, in the storage and warehouse business today, under any conditions, there is no profit in the actual work of calling for and delivering goods. The delivery equipment of a company in this line provides the greatest factor in the cost of doing business. Deliveries are at once the greatest problem and the greatest expense. It is simply a question whether or

not they are using the equipment which will give the most satisfactory service during the time it enables them to reach out and serve bigger territory.

For this reason alone the Manhattan Company has introduced motor cars, and are now eliminating horses entirely, as a trade-creative and not a cost-reducing factor. To use an actual illustration of trucks building business, orders coming from One Hundred and Fiftieth and One Hundred and Sixtieth street territory, known as Washington Heights, one of the city's newest and finest residential sections, with a motor car we can be filled in that territory, from either the warehouse at Lexington avenue and Forty-second street or from the one at Seventh avenue and Fifty-second street, two or three times a day. With a team not more than one order a day in the Heights could be filled. If the wagon itself made the trip twice, which would be problematical, there would have to be a fresh team. It is readily apparent that with trucks we are taking care of two or three orders where one grew before.

You may talk all you want to about trucks replacing so many pairs of horses and so many wagons. They do. What we are interested in, though, is how many orders in outlying territory those cars will enable us to fill. We want to know how much the use of a motor truck will multiply the unit of business which a horse-drawn van can handle. We are finding a very satisfactory answer to the question in the use of power wagons.

Proof of the Manhattan's satisfactory answer is that the company is now using one 4-ton Studebaker wagon and two 3½-ton General Vehicles, while two more G. V.'s, one of 2,000 pounds and one of 2 tons capacity, are being built to order for it. The cars are in service in the general household goods and safe deposit storage business of the concern. They are exceptionally ornamented, some of the G. V.'s containing a big picture of the immense Manhattan warehouse at Lexington avenue and Forty-second street on their sides.

The once commodious stable of the company is



Two Styles of General Vehicles Operated by Manhattan Storage & Warehouse Co., New York City.



G. V. Electric Used by a Chicago Warehouse and Storage Concern.

reduced to fourteen head of horses. As these die off or are relegated to country pensions trucks alone are brought into play. With its extensive trade the concern is naturally required to hire a great many teams during the rush seasons of the year, but even though it has gone into motor truck operation only conservatively, it is working with a purpose and proposes in time to build a fleet which will take care of its necessities the year round.

A big garage replaces the stable of the Manhattan. The company does its own charging and has found that not a single charge has ever been completely exhausted in the average daily run of 45 miles to the truck.

Expert chauffeurs are employed, licensed under the regulations of New York state. Several of the men, however, are veteran employees graduated from the seat of the company's old horse-vans to the more dignified position at a General Vehicle steering-wheel. Owing to the great amount of extremely valuable goods handled regularly by the Manhattan interests, only drivers with certificates of the highest character are employed, and it is notable that most of the men



A G. V. Electric in Warehouse Service.

have been with the company for a great many years. President Wells believes that it is more practicable to train wagon drivers for positions as chauffeurs, providing they are tried in the company's service, in view of the fact that a saving in extra labor is oftentimes accomplished. Your true chauffeur will demur at loading or unloading, while men who have almost grown up in the Manhattan company's service take this work as routine with the operation of the car. But even the veterans risen from the reins must undergo a rigid examination in motor truck operation under New York state law before they are given the promotion.

With competent drivers, motor trucks provide an extraordinarily safe means of transportation. We have not had more than half a dozen accidents due to collision of any sort. This is naturally a big consideration, on account of the valuable nature of most of the cargoes. Every accident was during the old days with horse-drawn equipment.

The Manhattan Storage & Warehouse Company owns a seven-story fireproof warehouse extending along Lexington avenue from Forty-first to Forty-second streets. Another of its properties extends along Seventh avenue from Fifty-second to Fifty-third

street, giving it the greatest aggregate amount of space controlled by any concern in Gotham.

The electric truck is also employed by many safe deposit companies where the cargoes are extremely valuable, fragile and perishable. The fact that the electric is free from fire liability, breakdown and street delay makes it especially adaptable for such service.

For instance, the Lincoln Safe Deposit Company, 42 East Forty-second street, New York City, has been doing business more than 30 years, consequently dating back considerably before the greatest utility of motor wagons was discovered. Years ago, however, during the rapid extension of the Borough of Manhattan and other portions of the Metropolitan district, the problem of reaching its many customers quickly and economically, with absolute assurance of safety, became one of the greatest confronting the concern.

Consequently, when trucks first proved their practicability in many lines, the Lincoln Safe Deposit staff became interested. Once their interest was known, the familiar arguments for the use of modern equipment were presented. General Manager Walter C. Reid and his staff learned that trucks were very economical, that one good one would replace two or three teams. It was proved to their satisfaction that the maintenance of gasoline or electric cars could be reduced to a very satisfactory cost per ton-mile. The minimum amount of space required for housing motors, as compared with the ramifications of a stable and wagon-shed, was impressed upon them. The ever-ready qualities of the truck were expounded.

As conservative officials in charge of a large deposit institution, Mr. Reid and his confreres thought the matter over carefully before going so far as the purchase of a single 1-ton car. Endless calculations were made and they instituted careful investigation of the ratio of truck troubles to the ratio of horse-and-wagon ills.

Then the unexpected happened, for the company reached unusual conclusions. It purchased a fleet of seven General Vehicle trucks, five of 3 tons capacity and two of 1 ton capacity, and in considering the purchase of even more vehicles as the business expands, bases its reasons for using motors on the following:

1. For the transportation of extremely valuable loads, some of which are worth a king's ransom, the self-propelled is superior to the horse-drawn vehicle.

2. Of self-propelled cars, the electric is the more desirable for this work in view of the fact that it proceeds at slower speeds, is more readily stopped and started in danger of unforeseen collisions.

3. Electric trucks, being comparatively silent in operation and relatively more dignified as power wagons go, are apt to appeal very favorably to the wealthy clientele with which a representative safe deposit concern must come in contact.

4. Electric trucks, properly equipped, subject their contents to a minimum of jolts and jars, a feature which is essential in the handling of fragile and costly household goods, silver plate, jewelry or paintings.

5. For the purposes outlined, trucks are very much more desirable than horse-drawn equipment because of the total absence of penetrating, horsey odors which may even lead to the decay of perishable contents, furs or such like, of a van.

6. The sanitary and other features of electric cars are equal in every respect to whatever advantage

of economy and reliability there may be obtained by their use with a safe deposit company.

The amount of business handled with the seven General Vehicle vans of the Lincoln Safe Deposit Company is imposing. Practically every large order received by the concern involves their use. The cars, particularly at certain seasons of the year, are in operation from early in the morning until as late in the evening as approaching darkness will safely permit.

In New York, a cosmopolitan beehive whose inhabitants from the richest to the poorest, frequently change their place of residence, there is an immense volume of business in the storage of valuables and everyday household goods and furniture. It is the experience of the Forty-second Street company that in a great many cases orders for the storage of all the effects of a family for a given period may be placed periodically every one, two or three years.

With a great many families following this routine it is easy to appreciate the amount of storage transacted. Apartment-dwellers in the metropolis, and this means a very great percentage of the population, are accustomed to lease for one, two or three years. When the typical New Yorker's lease expires, the chances are that he is obsessed with the idea of moving, to gain one convenience or another. While he makes up his mind, the family go to a hotel, board or take a furnished apartment and their own effects are taken care of by the best safe deposit company available.

The Lincoln company during its thirty-odd years of existence has built up a very select following and, as a matter of fact, possesses prominent men upon its directorate, W. K. Vanderbilt, Jr., F. W. Vanderbilt, M. C. D. Borden and Joseph P. Grace among others. The work which the company's vans are called upon to do is, therefore, of the most exacting character.

A collection of paintings from a famous Fifth avenue residence once filled a 3½-ton car, making it a perambulating parcel worth hundreds of thousands of dollars. A fur coat valued at \$40,000 was once a portion of the contents of another van. Trunks and cases of all sorts of valuable merchandise, with crates and barrels of the finest furniture and bric-a-brac, are frequently handled. The electrics are pronounced to provide the best possible service in this line. Only once in the lengthy history of the company has one of its vans suffered accident, and the occurrence was taken care of in a fashion preventing any loss. Incidentally, it happened years ago to a horse-drawn vehicle in a collision.

The cars go all over the five boroughs. On long hauls they average, according to the records of the company, 15 to 18 miles per day, making 5 to 6 miles to the trip. Shorter hauls with quick loadings and unloading enable the cars to average 25 to 40 miles per day. There are a great many short trips, incidentally, as the Forty-second street warehouse is convenient to a large number of the company's customers along Fifth, Park and Madison avenues and in the fashionable East and West Sixties and Seventies adjacent thereto.

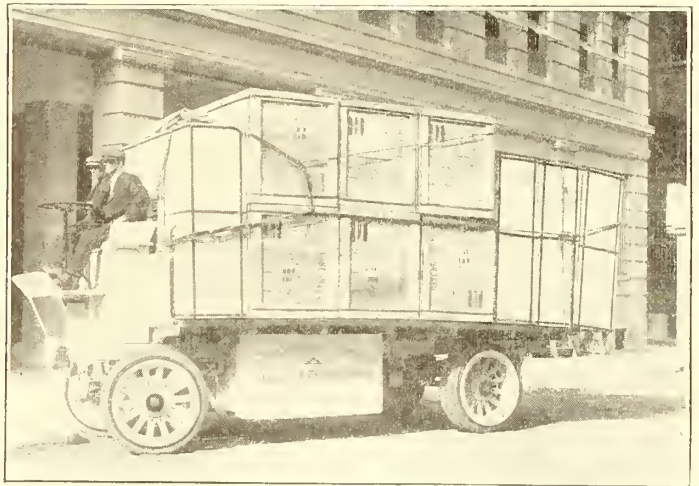
Each car in Lincoln service is charged every night in the private garage maintained by the company. The garage is fully equipped so that none but the trusted employes of the company itself may repair, renovate, charge or re-tire the vehicles.

According to Mr. Reid, during the time he used horses, he found that the stock was almost invariably tired out by ten or eleven o'clock in the morning, and

two teams a day became a necessity for one wagon. "As we hired a great number of teams, employing two of them a day per wagon was a very expensive proposition, and you may believe that delivery became one of our greatest problems. Not only that, but hired teams and even our own staid nags could never be depended upon absolutely to carry a wagon of valuables without spilling. This company doesn't take chances.

"Even as regards the possibility of strong, equine odors penetrating paintings, furs or household goods, it does not take chances. We have arrived at the conclusion that the electric vehicle is very much cleaner and appeals directly to our best customers for that reason.

"We keep seven wagons busy because we have the largest safe deposit warehouse under a single roof in New York City. It embraces eight floors 150 by 200 feet in dimensions, or in all more than eight acres of storage space. An idea of the cubic volume of the structure will be gained from the fact that there are more than 1,600 rooms of various sizes, each a veritable steel safe in itself.



Trucking and Teaming Companies Are Gradually Adopting the "No Trouble" Electric.

"You would be surprised to see the favor visited upon our trucks by customers. There is so much dignity about a big electric rolling up for a load of household goods, and the crews in their neat uniforms put up such a good appearance, that we figure considerable advertising value in the use of the modern vehicle. To sustain the substantial idea of our work, and also to minimize road hazards producing tire and mechanical trouble, we limit the speed of the cars at 8 to 12 miles per hour. The pace is fast enough. As a matter of fact, if you could realize the rapidity with which we handle goods under the new regime as compared with the old, you would agree with us that the company is giving service as speedy as it is satisfactory."

A special arrangement has been made by the Lincoln Safe Deposit Company with the Bowling Green Storage & Van Company, of 18 Broadway, New York, whereby goods consigned for safe deposit may be taken from it or brought to it from European or far-distant American cities. The Bowling Green Company, employing horse-drawn equipment exclusively because of its practice of sending its vans bodily across the ocean with their contents, co-operates in transatlantic and transcontinental moving.

Manufacturing Worm Gears by a New Process

A Description of a New Process and Some Features of Past Methods

BY CORNELIUS T. MYERS

WORM gearing is ancient in principle, but its development has been very slow, due to difficulties of the varying and largely unfavorable results obtained in its use. The rapid development of the automobile and motor truck has, however, opened up a large field for it, and as a natural result of this critical and exacting demand came improvements in manufacture, including the patented machines and devices herein described.

ASSEMBLY CHARACTERISTICS.

Two general types of worm gearing known as the straight type and the "hour-glass" type are in common use today. The straight type worm is a modification of an ordinary screw thread—the pitch diameter, outside diameter and root diameter being constant from one end of the worm to the other. More correctly speaking, the pitch line of a straight worm is a spiral traced on the pitch cylinder, the surface of which lies tangent to the pitch diameter of the gear. The pitch line of the "hour-glass" type worm lies on a surface which has a general form similar to the little device from which it takes its name. The pitch line of the threads has a compound spiral form, the threads constantly growing larger in diameter as they recede from the middle of the worm toward either end of it. The pitch surface envelops an appreciable part of the pitch circle of the gear, instead of being merely tangent to it at the middle as in the straight type. In the straight type the linear pitch of the worm threads remains constant, whereas in the "hour-glass" type it diminishes on both sides of the center-line. The straight type has a great advantage over the "hour-glass" type in that it requires accurate alignment in but two planes; whereas the "hour-glass" type requires accurate alignment in three planes, which introduces a difficult element in the mechanical assembly of the gearing. There is hardly any necessity for going into details on these points, as they are quite generally understood.

MANUFACTURING CHARACTERISTICS.

The design of driving-axles is such that the distance between the axis of the gear and that of the worm is established accurately and permanently by jigs and fixtures. With straight type worms there is no necessity for accurate adjustment fore-and-aft in line with the axis of the worm. This leaves but one accurate adjustment to be cared for—bringing the mid-plane of the gear teeth into the plane of the axis of the worm. These features are of importance in the original assembly of the gearing by experienced hands, and are of far greater importance if the gearing must be adjusted by those who are not expert, in the service station, garage or repair shop.

The very accurate fore-and-aft adjustment of the worm called for in the "hour-glass" type is a serious point against it on the score of mechanical simplicity and danger due to derangement, for it is self-destructive if incorrectly aligned fore-and-aft, because of its

varying pitch and the constant pitch of the gear teeth with

which it must mesh.

The combination of rubbing and rolling contact between the surfaces of the worm threads and the gear teeth is a condition of operation that calls for correctly designed and accurately machined surfaces. The pitch, pitch diameter, lead angle and pressure angle of both the threads of the worm and the teeth of the gear must be uniform to assure the best results. The surfaces, also, subjected to this contact must be of the greatest durability combined with a low friction coefficient; and in practice extending over many years the metals to be used have been almost uniformly settled upon as hardened steel for the worm, and phosphor bronze of a particular and carefully prepared alloy for the wheel. That the hardening of even the best of steels causes surface distortion is a well recognized fact. This distortion is particularly noticeable in complicated forms such as worms offer. The hardening of a perfectly formed worm causes distortion in the threads and variations in the pitch, lead, lead angle, etc., to a very marked extent; which no amount of ordinary polishing will serve to correct.

Operating under heavy loads and at high speeds these variations form irregularities in the thread surfaces that set up a severe hammering and abrading action on the working flanks of the teeth of the gear, and produce unnecessarily rapid wear. While of late years careful hardening and polishing had minimized this wear (and its attendant loss of mechanical efficiency) to the extent of making worm gearing very reliable and popular abroad and in this country, there was still much to be desired in the operation of worms so made. The straight type again lends itself more readily to this finishing operation, which is another point in favor of its more universal adoption. The process described herein includes a worm thread grinding operation, that gives an accuracy of surface heretofore impossible of attainment. Combined with a number of refinements in the hobbing process for forming the teeth in the gear, this grinding operation gives surfaces which in operation mate so perfectly that, when proper materials are used and the gearing is correctly mounted, the area of contact is much greater than has heretofore been the case. To get reliably accurate working surfaces on the hardened threads it is essential that they be ground not by any approximate buffing method, but by precision machines. Here again the straight type of worm lends itself very handily to the newly developed processes, one of which is a grinding operation on a precision machine of a new type. In connection with this machine is used a dressing tool for regenerating the peculiar shape of the abrasive wheel.

In considering a straight worm, the section at the threads is a rack with straight-sided teeth. The worm being a sort of endless rack, every axial section will have the form shown. The prolongation of any flank will intersect the axis of the worm, making an angle, which is the pressure angle, with a perpendicular at the point of intersection. If a line should be revolved about the worm axis and at the same time moved at a uniform rate along the axis a distance of

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the lead for each revolution, it will take successively the positions 1, 2, 3, 4—10. The thread worm surfaces, then, can be formed by this movement of this line, and every element as shown by an axial section will be a straight line inclined at the selected pressure angle and of a length equal to the flank of the thread. The same surface will be formed in a steel bar if a lathe tool is placed in the position shown (the straight cutting edge pointing to the axis of the worm) and the bar rotated and advanced in accordance with the required lead; the elements of this surface being, of course, straight lines which if extended intersect the axis of the worm. Worms thus chased in a lathe are approximately correct in form but are expensive and subject to many manufacturing inaccuracies.

The ordinary method of manufacture is to mill out the space between the threads by a rotary cutter, the straight sides of which are made to slope at the normal pressure angle of the threads, the cutter being mounted on a spindle which is inclined normal to the lead angle of the threads. Such an operation, however, will not produce the desired surface described above, for the straight line elements will appear only when the thread section is made by a plane normal to the lead angle. In many cases, too, this cutter interferes and undercuts the thread surfaces below the pitch line. The gear, however, revolves in the plane of the axis of the worm and not in a plane normal to the lead angle; and to mate with such a worm and form some species of conjugate gearing the gear teeth must be subjected to a considerable amount of running in. The conjugate form of gear tooth, to mate with the correctly formed worm threads, as produced in the processes herein described, is the true involute which is so universally utilized in other types of gearing and which will mesh with the worm threads with the minimum amount of rubbing and the maximum amount of rolling contact.

PRODUCING CORRECT WORMS.

The problem of the production of milling cutters and grinding wheels that will produce a correct thread surface was solved as follows: A thread-milling machine with a rotary cutter is used. The cutter form is gotten by means of a generating tool, consisting of a carrier which can be gripped in the chuck jaws of the milling machine head. It carries a tool holder which swivels about a pivot, and can be clamped in any desired position. The edge of a straight steel tool passes through the pivot center of the holder and intersects the axis of the spindle of the milling machine. The milling machine is geared up for the lead which is desired in the finished worm. The tool holder is turned until the edge of the tool coincides with the desired pressure angle, and the tool moved out until it coincides with a point on the outside diameter of the worm threads, both tool holder and tool being clamped in these positions. When the milling machine is started the carrier will revolve and move axially as determined by the lead gearing, and the part $a'b'$ of the edge of the tool will pass exactly over the surface of the desired worm thread, taking successively positions as at 1, 2, 3, 4, etc. A soft blank is mounted on the cutter spindle C , and rotated as the edge $a'b'$ is caused to work against it in its travel. The tool will generate on the flank of the soft blank a curved surface which has the desired form for milling the correct thread surface in the steel bar, a surface the elements of which are straight

lines inclined at the desired pressure angle and intersecting the axis of the worm if prolonged. A templet is made from the soft blank, and a hardened cutter is made to fit the templet. This hardened cutter having been formed, as it were, by the elemental generating line of the desired thread surface, it, in turning on the cutter spindle, will produce this surface in the bar when the bar, gripped in the chuck jaw of the machine, is rotated and fed past the cutter at the original rate as determined by the lead gearing of the machine. The curvature of the cutter flank varies considerably with variations of pitch diameter, pitch pressure angle and lead angle of the worm to be formed. It is a very difficult and tedious task to calculate the correct curvature and to produce a cutter with this curvature by any method of "laying-out," but it can be quickly and accurately formed by the device just described.

The thread-milling machines themselves are heavy and rigid so that great accuracy can be maintained under the heavy feeds and high cutting-speeds which are essential to minimum production costs. After the threads are milled on the partly finished bar or forging, they are carbonized and hardened. The piece is then mounted in a thread grinding machine, which grinds with precision the thread surfaces and corrects the very considerable inaccuracies formed in hardening. This machine is automatic in operation. The table carrying the worm carries it against and by the abrasive wheel, the head meanwhile turning the worm in accordance with the pre-determined lead. When one lead of the worm has passed the abrasive wheel, the head carrying this wheel drops back and the table reverses its motion, going back to its original position. The next lead is indexed into position on the table, the grinding head comes forward into position and the face of this lead is ground. This sequence of operations is continued until the worm has been ground to the proper pitch diameter.

But in order to grind the surfaces of the worm threads as true as they were milled, it is necessary that the working face of the abrasive wheel be formed and maintained in the same shape as the flank of the thread-milling cutter. This is accomplished by means of another kind of generating tool which operates against the face of the abrasive wheel on the same principle as the generating tool which formed the basis of the construction of the milling-cutter. This consists of a carrier and tool-holder similar to the device previously described. The tool which passes through the tool-holder is a round bar and near its outer end is mounted a diamond for dressing the abrasive wheel. The carrier and tool-holder contain a train of gearing which gives the tool a reciprocating motion. This train of gearing is driven by a rope belt running over the pulley shown near the left-hand shank of the carrier. The operation of dressing the abrasive wheel now becomes a very similar operation to that of generating the flank of the milling-cutter. The tool-holder is inclined until the point of the diamond in its reciprocating motion passes back and forth along the elemental line of the thread surface to be formed. The carrier is then given the same spiral motion as the worm to be ground, the tool is given a rapidly reciprocating motion by means of power applied through the rope belt, and the diamond dresses the abrasive wheel, against which it works, into the same essential contour as that of the milling-cutter. This contour having been formed by the generatrix (the path in which the diamond point reciprocated) of the desired thread surface, it will in turn

grind the desired surface on the steel threads of the worm.

Micrometer measuring attachments tell the operator when the work is within the close limits called for on the blueprint, and he re-dresses the wheel according to the requirements of the work. After grinding, the threads are polished and burnished to remove all traces of metal or grinding dust, and present a perfect surface to the flanks of the gear teeth when in operation. This accurate grinding operation reveals distinctly the complex distortion produced in hardening. From .020" to .060" is ground off the high spots before the surfaces become smooth and uniform. Occasionally there are greater variations. These irregularities produce variations in the lead, pitch, pressure angle, pitch diameter, etc.; and one can readily imagine the damage which a quarter of the above variations can produce when revolving at high speed and under heavy load against the teeth of the gear. An abrupt variation in thread surface acts on the gear tooth like an adze on a plank. Even when irregularities are polished out to a considerable extent, there are excessive local increases in the pressure per square inch between thread and tooth, due to these irregularities, and a resultant breaking down of the lubricating film, with the usual consequences.

PRODUCING THE GEARS.

A perfect worm is the basis on which perfect gearing must be built, but it is just as essential that the form of the gear teeth be correct and accurately machined in the gear blank. It is commonly supposed that inaccuracies in the gear teeth are of no great importance because in service the worm will gradually bed itself into the gear teeth, forming to itself the working flanks of the teeth. When using a very soft bronze in the gear blank such an effect is approximated though never thoroughly realized. With the hard phosphor bronze, which in some cases is even chilled to make a more dense and close-grained metal structure, the most perfectly formed worm will be worn out of shape before it can bed itself into the gear teeth and form them correctly. In endeavoring to do this the worm will often show more wear in some parts of the thread surface than will be found in the softer teeth of the gear. This is due to a considerable extent, to the fact that the bronze becomes a kind of lap after the skin formed by machining is broken. Small abrasive particles from impurities in the casting, or worn from the surface of the worm, or present in the gear case, are retained or picked up and held by the bronze, and a lapping process starts at once. High spots on the gear teeth must be worn down at the expense of the surface of the worm threads. This more or less uneven wear on the various threads reacts on the gear teeth, so that wear once well started proceeds with greater or less rapidity throughout the life of the gearing.

As accuracy in the product is so essential the machines must be very rigid and designed so that there will be a minimum of spring due to operating stresses and little or no wear. The rotating table that carries the gear blank is supported near the periphery. The head is a stiff casting sweeping well back of the hob arbor which has very little overhang, and the bearing surfaces are unusually large. The hobs are mounted on a sliding platen carried by the adjustable head. The hobs are fed along the position that will later be occupied by the axis of the worm.

The hobbing operation is a double one. The roughing hob removes over 90 per cent of the metal cut away

in generating the gear teeth. It is tapered so that the wear on the various teeth is quite evenly divided. The finishing hob has a large number of teeth—a feature essential to an accurately generated tooth flank—and has a comparatively small amount of accurate work to do, in place of the large amount of less accurate work performed by a hob which has to have heavy enough teeth and arbor to remove all the metal necessary to form the gear teeth. The finishing hob leaves a tooth surface that cannot be improved upon by any method of hand fitting or running-in. Any worm will mate correctly with any gear, if properly mounted and aligned; and when put into service there will be little or none of the so-called bedding-in during the first stages of service. Within a very short time, and in most cases immediately, the contact between the worm threads and the gear teeth shows that the pressure is being distributed over the entire surface of the gear teeth, instead of being localized in one, two, or possibly three, spots. With practically a perfect worm extreme care in making the hobs is essential for securing this much-to-be-desired distribution of load by perfect contact. The hobs are designed on sound fundamental theory which special machines carry out in practice, and essential refinements in hobbing the gear teeth are secured to supplement the improvement in the worm thread surfaces. A hob sharpener employs a grinding wheel the working surface of which is generated to the correct form in a manner similar to that of the worm grinding wheel.

MEASURING INSTRUMENTS.

For the attainment of accuracy in the final product, accuracy in each operation is a prime requisite of economical manufacture, and this accuracy, so very necessary in worm gearing, can be maintained only by the careful checking of each operation. Micrometric devices are used for guidance during manufacture and for final inspection. These devices work on the principle of the magnification of error, and by making small errors quite apparent train the workmen to use the refinements of the machines to their full advantage, and allow close checking by inspectors.

(To be continued)

Brighter Outlook for Electrics in Norway

The Christiania consulate general has reported from time to time on electric cars and their chance of sale in Norway, and from the information obtained on those occasions it was concluded that because of the many hills in Norway the use of such a vehicle would not be practicable. An address delivered by Mr. Arthur Bjerke, an electrical engineer, apparently changes the previous reports on this subject, for Mr. Bjerke considers the electric car of the present day well adapted to road conditions in Norway. He said, in part:

"The type of car most used, and therefore especially worthy of mention, is the 'electromobile,' provided with a battery that drives one or two electromotors. When the battery is discharged it can be recharged while remaining in its place or be exchanged for a new charged battery.

"It is incorrect to say that a car of this type can be driven only for short distances and on flat, good roads, as it has demonstrated its ability to traverse hilly country and to go more than 100 miles on a single charge. In America and England it is used in as hilly country as any in Norway. The motor in an electric car can for a short time be overloaded 300 per cent if necessary to take a steep hill.

National Electric Light Ass'n Discusses Electrics

Experts Discuss New Plans and Offer Many Suggestions for a Greater Industry

AT the recent convention of the National Electric Light Association, held at San Francisco, the electric vehicle situation was thoroughly discussed.

The difference between selling motor-driven vehicles and central station energy, the inconsistency of electric service companies employing gasoline-engine-driven automobiles when advocating the use of electric vehicles, and the reasons for the high cost of electric cars, constituted the principal topics in connection with electric vehicles which were discussed at the National Electric Light Association convention in San Francisco.

George R. Murphy, representing the Electric Storage Battery Company, in speaking of the use of electric vehicles on the Pacific Coast, pointed out that the electric service companies, with few exceptions, are supplied with energy over long transmission lines, therefore the operation and maintenance departments must employ vehicles which will travel a long distance without being compelled to stop frequently for supplies of energy. Nevertheless, the central station companies in large communities are using and encouraging the use of electric vehicles where possible. Conditions are specially favorable to the use of electric vehicles in Los Angeles, San Diego, Sacramento, Stockton, Fresno and Oakland, but there are numerous hills in San Francisco, Portland, Tacoma and Seattle. In San Francisco the grades reach a maximum of approximately 30 per cent, and it is inadvisable to run loaded commercial vehicles on such streets because of the limited braking facilities. Electric vehicles are being used, however, on streets having a grade of from 16 to 20 per cent. Where the hills are as steep as those in San Francisco larger batteries must be employed than are required in more level places. Where this fact is overlooked by enthusiastic vehicle salesmen there is likely to be complaint regarding the inability of electric vehicles to climb hills or to run long periods between charges. Wherever electric vehicles have been selected with characteristics suited to the service they are required to perform complete satisfaction has been reported. There are at present in the three Pacific Coast States approximately 265 commercial electric vehicles, ranging in carrying capacity from 750 lb. to 5 tons. In no city is there any very large fleet of trucks. Instead, they are distributed among a large number of owners.

A close co-operation between vehicle manufacturers and central stations is absolutely necessary, pointed out Mr. Murphy, if the use of electric vehicles is to be increased. This is evident in Spokane and San Francisco, where the central-station companies have established a battery service system. With this system owners of trucks are guaranteed expert attention to batteries at a lower annual expense than could be obtained otherwise. Furthermore, the radius of action of vehicles is increased. For example, one baggage transfer company operates between four or five railroad terminals and is able to cover 75 miles a day with a 1-ton vehicle. Without the battery-service system this mileage could not be attained unless extra batteries or another truck were purchased.

If electric vehicle manufacturers expect to develop their industry they must maintain service stations within convenient reach of every community in which it is desirable to sell electric vehicles. Mr. Murphy declared that he knew of electric trucks being inoperative for three weeks, waiting for special parts to be ordered and received from the manufacturer, 3,000 miles away.

R. L. Lloyd of the Philadelphia Electric Company stated that the process of selling electric vehicles is entirely different from the sale of electrical energy, as the salesman cannot complete the deal unless his company has taken an agency. The speaker expressed the belief that electric vehicle salesmen should not lay too much emphasis on the low rate which prospective vehicle users may obtain in purchasing energy for charging batteries. Other advantages should be pointed out to interest prospective users. When the company is required to sell energy at too low a rate, there will be no inducement for central stations to encourage the use of electric vehicles unless it is to fill the valleys in the load curve.

There is still a great deal of educating to be done as too many persons consider that electric vehicles are luxuries and chiefly for the use of women. The speaker expressed the belief that a battery service system similar to that maintained by the electric service company of Hartford, Conn., would encourage the use of electric vehicles in many other cities, as electric vehicle users would then have to purchase only the vehicle and not the battery.

Arthur Williams of the New York Edison Company expressed the belief that the performance of electric vehicles on steep hills cannot be equaled by other types of vehicles. He also said that it is a reflection on the industry for so many central station companies to employ gasoline-engine-driven and horse-drawn vehicles while advocating the use of electric vehicles. To give some idea of the prospective field for business lying at the door of every central station, the speaker said that the cost of feeding horses in this country is at least three times the total central station income, which is assumed to be \$350,000,000. As the difficulty of substituting electric vehicles for horse-drawn vehicles lies in the expense of the change, it might be possible for central stations to replace horses with electric vehicles by issuing equipment trust certificates similar to those employed by railroads.

John F. Gilchrist said that there is altogether too much tendency among central station companies to argue that before anything worth while can be done in developing the electric vehicle industry the price of vehicles must be reduced. On the other hand, vehicle manufacturers are arguing that rates for electric service are too high and that central station companies have not given sufficient consideration to their own interests. The speaker agreed with the latter opinion, and stated that the Commonwealth Edison Company has only recently begun to give attention to the exploitation of electric vehicles. In many ways the support of important persons in the electrical industry has been lacking, at least so far as using electric auto-

mobiles personally is concerned. It was suggested that if men who are influential in electric service organizations would prevail upon their superiors to use electric vehicles and furnish them to the heads of different departments the interests of the company would be extended and a wide field provided for the electric vehicle industry.

Herbert A. Wagner pointed out that the cost of electric vehicles, particularly in small sizes, is high compared with the cost of gasoline-engine-driven vehicles because the former are produced on a much smaller scale. The production will be increased, and consequently the cost will be reduced, if every central station will purchase at least one electric vehicle and encourage persons in the territory it serves to use similar vehicles.

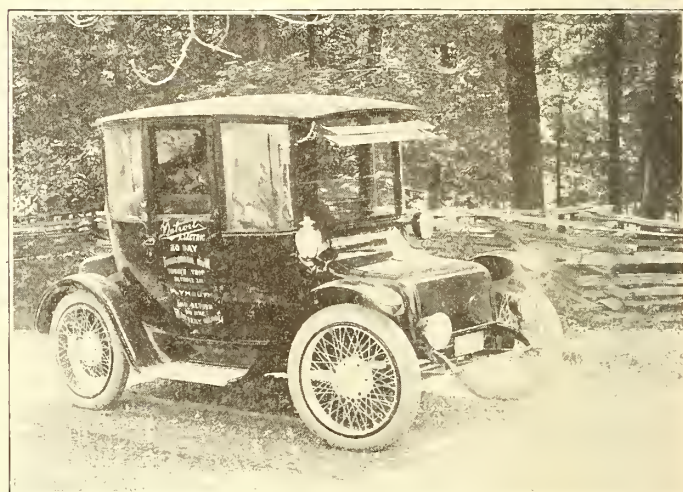
In closing the discussion, A. J. Marshall, secretary of the Electric Vehicle Association of America, declared that there are about 2,700 commercial electric cars in New York City, or about 45 per cent of the total number—gas and electric—used there. He also referred to an organization in New York City which is preparing to operate electric taxicabs in all of the principal cities in this country. In closing, he said that if a gasoline car and an electric vehicle were started together at Forty-second street, New York City, in the direction of the lower end of the city, the electric car would arrive at the Battery first.

The Electric Automobile Increases in Popularity

"I wouldn't be without my electric any more than I would be without my maid or any of my household necessities," said a woman owner of an electric vehicle, who is active in social circles in New York and a nearby summer colony. "My electric is a friend of which I stand in constant need for little morning spins in the park, for calling and shopping, for matinee and for dinner and theatre, and it never fails me; I'm simply in love with it," she concluded enthusiastically. This woman's words explain quite clearly why the electric pleasure car is increasing in popularity as a lady's and family automobile. She knows that it fulfills all of the demands of her daily routine of calling, shopping and pleasure seeking. She knows that she likes to run it because there is a certain charm in its simplicity of operation and control—a sort of mild fascination. She knows, too, that she can step into its beautifully cushioned and brocaded interior, enjoy every minute of her ride and arrive at her destination as fresh and spotless as when she started, without so much as a curl disarranged. She also knows that she can wear her prettiest and most delicate gown with the confidence that not even as much harm would come to it as in a parlor car. She has the car under perfect control at all times, so she loves to have the children with her—and she could run it almost the first time she stepped in it, too. This explains to some extent why there are 73 women in Manhattan alone who own and run electric automobiles. One of the most notable changes in electric car building has been in the batteries. Thirty miles used to be the limit on a single charge of battery, but the 1915 models can cover 85 miles or more on one charge of the batteries. Facilities for charging have also been improved so that the owner of an electric car will find frequent and convenient charging stations within a radius of a hundred miles of New York.

Chicago to Have New "Detroit" Service Station

Coincident with the news that Chicago will be made a central distributing point for Detroit electric automobiles comes the announcement by D. E. Whipple, manager of the big new central district, that work has already begun on a large new Chicago service station. When interviewed last night Mr. Whipple stated: "Our new building will be located at 2429-2431 Wabash avenue, and will serve a large territory, embracing 76 cities of over 10,000 population each. It is to be 50x194 feet, one story in height, and of reinforced concrete, strictly fireproof construction. A feature of the new structure will be the entire absence of posts on the main floor. This is regarded as decidedly advantageous in an electric car garage as it permits the rapid handling of cars without any chance of mishap. The main garage floor will be surrounded on three sides by a mezzanine floor which will be used to accommodate stock rooms. In these rooms will be kept adequate quantities of parts for all Detroit Electric models and orders will be filled from all the territory handled by the Chicago branch.



"Detroit Electric Which Made Twenty-Day Interurban Runs, Leaving Detroit According to Schedule and Returning on the Original Charge After Completing Distances Averaging Nearly a Hundred Miles Daily."

"In the basement will be the boiler room and a commodious locker room for employees. Shower baths will also be provided, as well as other features for the comfort and convenience of the working force.

"During the last year the business of the Chicago branch has greatly outgrown the present service station. In fact, they have found it necessary to lease outside space. The new facilities, however, will make it possible to greatly improve service both to Chicago owners of Detroit electric cars and those in the territory which will henceforth be served from Chicago as a central point. Last year Chicago branch business ran close to a million dollars in volume and plans are being made for a big increase within the next twelve months period. When the new building is completed and occupied, excellent care can be taken of every demand which shall be made."

U. S. L. Plan Favorable

The reorganization plan for the United States Light & Heating Company is meeting with favorable response. It is expected that the new company will have bought all assets of the old concern before August 1.

Rational Method of Determining Mileage

A Paper Read Before the Society of Automobile Engineers

THE problem confronting the builder of an electric vehicle, when it is desired to determine how many miles the vehicle will travel before exhausting a single charge of the storage battery, does not differ in essentials from the problem confronting the builder of an electric motor to drive the electric car when it is desired to determine the behavior of the motor under conditions approximating within close limits those of actual service. I have worked out in detail a method whereby the motors can be tested in the shop under practically service conditions. This method is used by one large builder of electric motors and will be described very briefly.

The electric motor is set up and connected mechanically to a rotatable element having considerable inertia or flywheel effect. The motor is then operated through a series of predetermined cycles such as are shown in Fig. 1, which is the series for a motor used on an electric commercial vehicle having a capacity of 1500 pounds or 2000 pounds.

This series may be varied in detail, but it must conform invariably to two essentials, as follows:

First, the equivalent schedule speed must be the same.

Second, the equivalent heating current, or square root of mean current square, must always be equal to the rated current capacity of the motor.

Once the series of cycles is properly adjusted, the test is started and the series repeated without interruption until the equivalent of one to two years' service is completed.

It occurred to me that a similar method may be worked out and used to determine the mileage an electric vehicle can make per charge of the storage battery, and I will endeavor to outline briefly herein my conception of the essentials of such a method. Each builder of electric vehicles has selected a test course within close proximity to his works, whereon the vehicle can be operated and tested. With

BY T. H. SCHOEPP

should be operated first in one direction and then in the opposite direction so as to compensate for grade and wind resistances.

Having agreed on the number of stops or cycles for a series (*e. g.*, in Fig. 3, I have assumed a truck of two-tons capacity making four stops per mile), it is

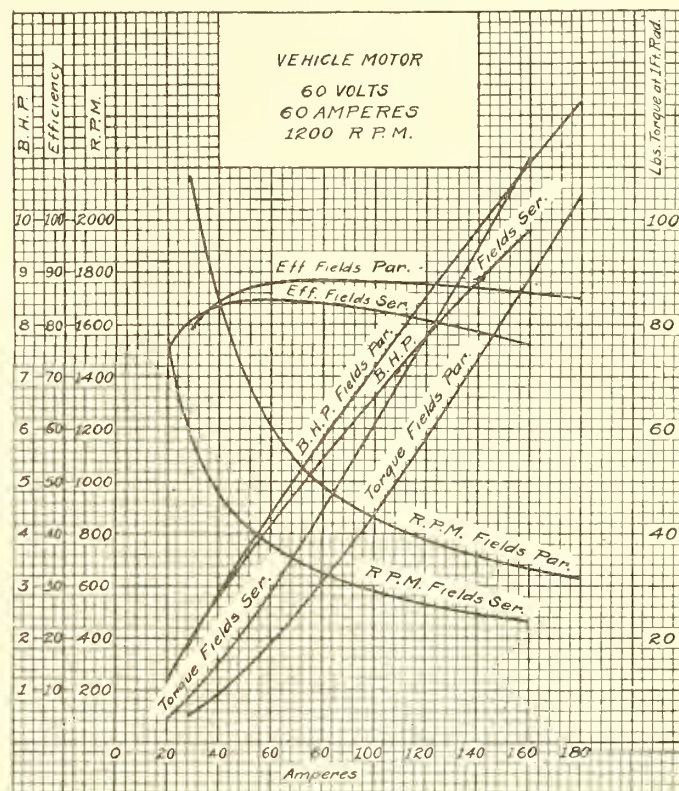


Fig. 2—Performance Characteristics of the Motor Used on a Two-Ton Truck.

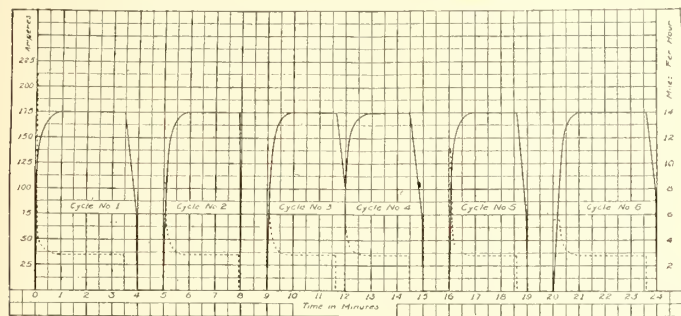


Fig. 1—Predetermined Cycles of Commercial Vehicle Motor.

rare exceptions these courses are on public streets, roads or highways, and the vehicle is subjected to the interruption of other traffic. The length of such a course depends on local conditions; in some places it may be as short as one-eighth of a mile, and in others one mile or more. I think it is generally agreed that the course should be level but, in any case, the vehicle

necessary to agree on the schedule speed and duration of each stop, which practically fixes the average running speed. For each capacity truck the three essentials should be agreed on as follows:

First, the number of stops or cycles for the series.

Second, the duration of each stop.

Third, the schedule speed, or, since the duration of the stop is fixed, the average running-speed.

Perhaps I can convey more clearly and simply the idea by explaining in detail a specific case, for which purpose a truck of two-tons capacity has been selected. The details of truck and equipment are as follows:

Capacity	4,000 pounds
Weight, fully equipped.....	10,300 pounds
Diam. of wheels over tires.....	37 inches
Total speed reduction.....	18.7:1
Edison battery, 60 cells "A-8."	
Westinghouse motor, V-49-C-3, rated at 60 volts, 60 amperes, 1,200 r. p. m.	
The details of the service are assumed as follows:	
Number of stops per mile.....	4
Schedule speed in m. p. h.....	6.25
Duration of each stop in seconds.....	20
Length of test course in miles.....	0.25
Length of test course in feet.....	1320

I have concluded that a single cycle should be completed in the same length of time and, therefore, have

*General Engineer, Westinghouse Electric and Manufacturing Company.

the same average running speed, no matter where the test course may be or what particular make of car is being tested. Therefore, I have shown in detail of cycle, three conditions, as follows:

First, assuming a rate of acceleration of one m. p. h. p. s., the speed-time curve *O A B C D E* being shown in solid line. The time-distance curve for this

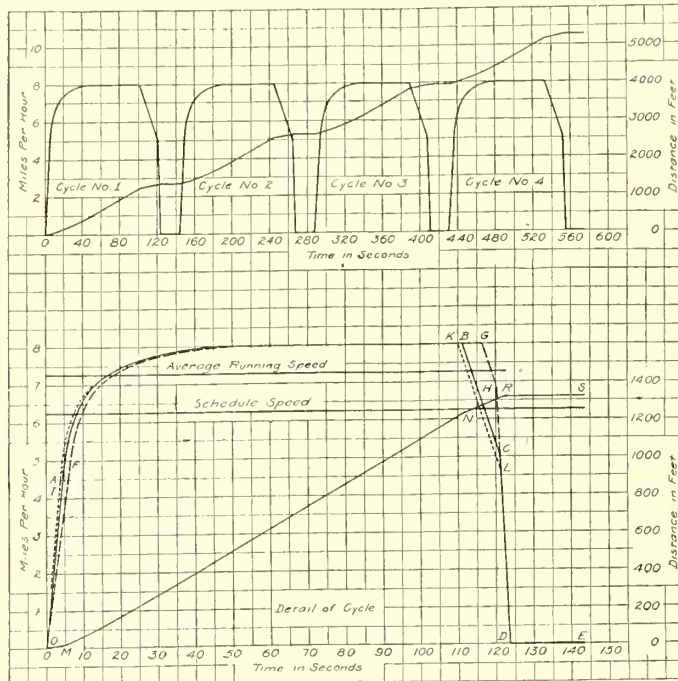


Fig. 3—At Top, a Series of Recurring Cycles Comprised in a Run of One Mile. At Bottom, a Single Cycle to Enlarged Scale and Showing Details.

particular cycle is shown by the solid line *O N R S*. rate of acceleration of $\frac{3}{4}$ m. p. h. p. s., the time-speed curve for this being shown in the broken line *O F G R D E*.

Third, assuming a rate of acceleration of $1\frac{1}{4}$ m. p. h. p. s., the time-speed curve being shown in the dotted line *O I K L D E*.

In each of the three cases the same rate of coasting and braking has been assumed.

In order that the average running speed and schedule speed should be the same in each case, it is necessary that the inscribed area of the time-distance curves be equal, which explains the difference in the length of time for coasting and braking.

The total figures for the three conditions under which this cycle is completed, show that the one under condition No. 3 requires somewhat less energy than the ones under conditions Nos. 1 and 2, but it draws energy from the battery during the accelerating period at a much higher rate, so that the three conditions impose on the battery practically the same delivery of energy.

In Fig. 4 is shown a detail cycle and a series of cycles for a passenger car similar to the curves in Fig. 3, which were for a truck.

The details of the passenger car and equipment are as follows:

Capacity, passengers	4
Weight, fully equipped	3,600 pounds
Diameter of wheels over tires	34 inches
Total speed reduction	5:1
Lead battery, 42 cells, 11 plates.	
Westinghouse motor, V-52-H rated at 80 volts, 28 amperes, 900 r. p. m.	

The details of the passenger car and equipment are as follows:

Number of stops per mile	4
Schedule speed in m. p. h.	$10\frac{1}{4}$
Duration of each stop in seconds	20
Length of test course in miles	0.25
Length of test course in feet	1320

In the detail cycle, three conditions have been assumed as follows:

First, acceleration at the rate of one m. p. h. p. s., the time-speed curve for which is shown in the solid line in *O A B C D E*. The time-distance curve is shown in the solid line *O M N R S*.

Second, the rate of acceleration is assumed as $1\frac{1}{4}$ m. p. h. p. s., the time speed curve being shown in the broken line *O F G H D E*.

Third, the rate of acceleration is assumed as $1\frac{1}{2}$ m. p. h. p. s., the time-speed curve being shown in the dotted line *O I K L D E*.

The time-distance curve is also shown for this condition simply as a matter of interest.

By selecting courses as short as $\frac{1}{4}$ of a mile, it is possible to continue to operate a series of recurring cycles until the charge of the battery is exhausted, without suffering from the interruption of other traffic. In fact, it is possible to operate such series for any length of course where one or more complete cycles can be made within its length; also the same condition will obtain where the course is so short that a complete cycle necessitates covering the course out and return, provided the course is sufficiently wide that the turn at the outer end may be made without slowing down and again accelerating. Should the course be so short or so narrow that a stop and complete turn, either continuous or of the switch-back nature is necessary, it is manifestly evident that energy is consumed which should not be charged normally against the mileage that can be obtained from one charge of the battery. Therefore, I would propose that

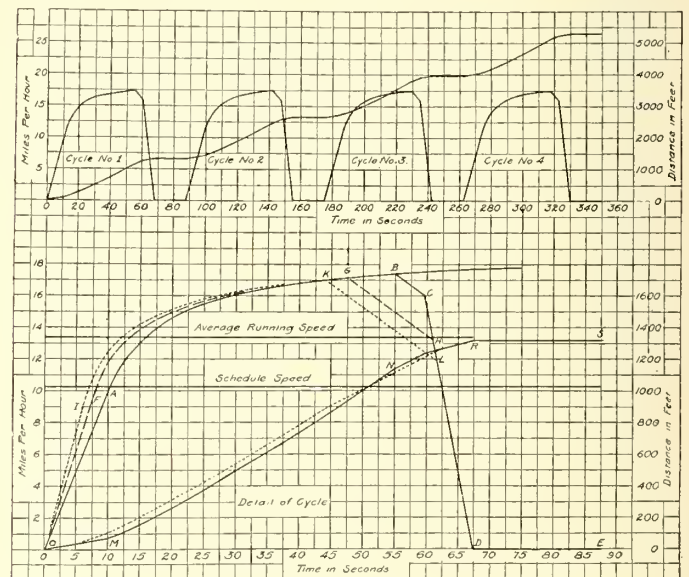


Fig. 4—At Top, a Series of Recurring Cycles Comprised in a Run of One Mile. At Bottom, a Single Cycle to Enlarged Scale and Showing Details.

a corrective factor be adopted for all stops other than scheduled and for all turns at the end of the course, wherein the vehicle has come to a stop and again accelerated.

I have assumed various conditions under which the vehicle would have to stop and again accelerate, other than scheduled; conditions wherein a vehicle would have to stop to make a continuous turn and accelerate other than scheduled; conditions under which the vehicle would

have to accelerate, make a switch-back turn and accelerate; the average result showing that the vehicle could run 8/100 of a mile further if it were not called upon to make one such unscheduled stop.

As a result of the investigation I suggest that a scheme of recurring cycles, such as has been outlined herein, be worked out and adopted for each capacity of commercial truck and passenger vehicle, and the number of miles which the vehicle can run on one charge of the storage battery be based on the following formula:

$$M = Mo + (Na - Ns) Ma. \tag{1}$$

The symbols have the following significance:

M = equivalent miles per charge of battery which could be obtained if the run were made without stops other than those scheduled.

Mo = the miles traveled as read from the odometer or actually measured.

Na = the number of stops actually made.

Ns = the number of stops as scheduled.

Ma = a constant factor indicating the additional miles, or fraction thereof, which it is possible to run with the energy that was otherwise used to accelerate the car.

It is the practice of vehicle builders to determine the mileage that the car will run on a single charge of the battery and then to guarantee a fraction of this, the difference being a matter of reserve to meet unexpected conditions in service. The builders usually guarantee between 50 and 75 per cent of the determined mileage, so that this case Formula No. 1 would read somewhat as follows:

$$Mg = R (Mo + (Na - Ns) Ma)$$

wherein R is the factor decided on by the vehicle builder and Mg is the guaranteed mileage.

This paper has been made very brief intentionally, as the benefits of the scheme cannot be exposed in writing except by a long and tiresome text, and an oral discussion will quickly bring out the advantageous features.

The details of each cycle of Fig. 1 are as follows:

Cycle No. 1	Accel.	1.5	Sec.	210	Amps.
	Running	202.5	"	35	"
	Coasting	29.	"		
	Braking	2.	"		
	Standing	60.	"		
	Total	300.	"		
Cycle No. 2	Accel.	5.6	Sec.	105	Amps.
	Running	169.4	"	35	"
	Coasting	0.0	"		
	Braking	55.	"		
	Standing	60.	"		
	Total	240.	"		
Cycle No. 3	Accel.	5.6	Sec.	105	Amps.
	Running	152.4	"	35	"
	Coasting	22.	"		
	Braking	0.	"		
	Standing	0.	"		
	Total	180.	"		
Cycle No. 4	Accel.	.0	Sec.	82	Amps.
	Running	149.	"	35	"
	Coasting	29.	"		
	Braking	2.	"		
	Standing	60.	"		
	Total	240.	"		
Cycle No. 5	Accel.	3.	Sec.	140	Amps.
	Running	152.9	"	35	"
	Coasting	22.	"		
	Braking	2.	"		
	Standing	60.	"		
	Total	240.	"		
Cycle No. 6	Accel.	15.3	Sec.	70	Amps.
	Running	140.	"	35	"
	Coasting	22.	"		
	Braking	2.7	"		
	Standing	60.	"		
	Total	240.	"		

Total time of cycle	= 24	minutes
Schedule speed	= 10.6	m.p.h.
Distance traveled	= 4.25	miles
Mean amperes hr.	= 35.1	

Second S. A. E. Report

The electric vehicle division of the Society of Automobile Engineers has the following recommendations to offer:

(1) The division recommends the adoption of two classes of motors for use upon electric vehicles, one class designed for 80 to 85-volt operation, characteristic curves to be furnished by the manufacturers for each of these two voltages. The second class of motors to be designed for 60 to 66-volt operation, characteristic curves for each of these voltages to be furnished by the manufacturer.

(2) It is further recommended that each motor shall carry a name-plate setting forth the following particulars:

Manufacturer's name and address; whether series, shunt or compound automobile motor; frame size; volts; amperes; revolutions per minute.

Under volts, amperes and revolutions per minute should be given the figures for both high and low limits of voltage as recommended above.

(3) It is recommended that the number of cells in lead acid type batteries be 42, and the number of cells in the nickel iron alkaline type 60. There are many cases where 44-cell batteries cannot be properly charged on account of low voltage of the current supply. The 42-cell battery can be divided to make a more convenient arrangement of trays. The use of 60 nickel-iron cells is considered by the division good practice.

(4) A revised and amplified definition is being submitted to electric vehicle manufacturers and allied interests for an expression of opinion, and recommendations concerning same will be offered at a later date.

Milburn Makes Long Tour

What is probably the longest tour through the country ever made by a Toledo man in an electric car was that of Robert J. Coulter of the Grasser Motor Company, who recently made the round trip from Toledo to Tiffin in a Milburn light electric.

Leaving Toledo in the morning, Coulter arrived in Tiffin at 11, entering the town at a speed of twenty miles per hour. The trip of fifty-seven miles was made on a single charge, and in order to prove that the car was capable of doing even more, Coulter used it for the remainder of the day in giving demonstrations and making business calls.

The car was charged on Thursday evening and used all day Friday in runs around Tiffin and to neighboring towns. The return trip was made with a little difficulty as the trip above.

Chicago Electric Revises Prices

A downward revision in prices has been announced by the Chicago Electric Company. The five passenger car now may be purchased for \$2,600, while the four passenger sells for \$2,450. A new model, the cabriolet roadster, also has recently been put on the market.

Motor Trucks in Contracting Work

To say nothing of the great improvement in the service, consider that motor trucks save 50 per cent of what the same work would cost with horses.

During the winter, according to J. A. Mercier, a general contractor in Detroit, he delivered to the Edison Company and Heating Company 70,000 tons of coal. He uses four five-ton trucks and trailers of equal carrying capacity. The round trip is six miles, and they made twelve trips a day; that is, they carried 120 tons of coal.

When he first had the same contract he delivered 30,000 tons of coal. A team of horses would make four trips a day under favorable conditions, and whenever the streets became slippery and during the winter he worked three-horse teams.

Today teams cost \$5.50 per day, so to do the work of any one of the trucks with its trailer would require six teams, or a cost of \$33 per day.

During the winter the heating company needed more coal than could be delivered during the ordinary hours, so he put on extra men and worked the trucks at night during the cold spell, which would be impossible with horses.

Loading and unloading is where the profit is made with a motor truck. You cannot waste time and make it pay. It takes three minutes to load one of the five-ton coal trucks, and when it arrives at the station it is unloaded very quickly.

In the general contracting business, where stone, brick, cement and other material has to be hauled, the automatic dump wagons are used. These are filled either from a chute or with clam shells. When they reach their destination the hydraulic lift elevates the front end and dumps the load. Then they are on their way back for more.

What a motor truck can do never was so plainly shown as during the cement shortage last year. The mills were getting out plenty of cement, but could not get the service on the railroads at the time, and important contracts and gangs of men waiting meant a big loss. A plan was devised whereby three trucks with trailers went to Wyandotte every morning and brought back their loads, making a return trip in the afternoon. Thus two carloads of cement a day were hauled and nine concrete mixers went on just as though there had been no trouble.

It is impossible to estimate just what this means in figures, but in no other manner could we have secured the cement to carry out the contracts.

Big trucks are a great thing for the contractors, builders and others in the surrounding towns which are connected by good roads. There are times when they need material and cannot take a chance on the railroads, especially when the order is for less than a carload. Here the motor truck comes to their rescue, the supply companies providing the service, for which anyone is perfectly willing to pay in the emergency. Otherwise he could not have the material with which to carry on his work.

All business which calls for heavy hauling over a distance is adopting the motor truck, and while some have not figured out an actual profit thereby, all concede the increase in the item of service is sufficient to make it desirable.

Beardsley Makes 1066.4 Miles in Ten Days

What is said to be a previously unreachable world's mileage record has been made by a Beardsley electric.

The car was started out on Tuesday, June 22, with Mrs. Volney S. Beardsley as driver. The actual mile-

age recorded for the ten days was 1,066.4, making an average daily mileage of 106.6 miles.

On every single day of the tour the car made in excess of 100 miles and pulled into the garage at night under its own power and without a single mechanical adjustment during the entire time of the tour.

The drives were over different routes every day, heading in every direction, from Los Angeles, so that all kinds of roads and every motor condition was encountered.

The car used was one of the first models built by the Beardsley Electric Company, and had over 4,000 miles to its credit before making this tour. It is stated by the Beardsley company that there was absolutely no additional equipment placed on the car, that it carried only the usual battery equipment.

Mrs. Beardsley, accompanied by a woman observer, appointed by the press upon each tour, the idea being to give an official standing to the test and to overcome any possible inference that the mileage recorded was not actual.

A remarkable feature of the tour was that the car one night was charged in a garage in Riverside, entirely away from home, and the following day, on its return trip, made the exceptional record of 114 miles.

Goodrich Silverton tires, Gould storage batteries and Westinghouse motor, all of which are regular Beardsley equipment, are undoubtedly entitled to their share in the credit for the remarkable performance.

When single charge mileage tests have previously been made, the public have been inclined to look upon them as merely the result of a special effort, and it is for this reason that Mr. Beardsley decided to make the tour cover ten consecutive days, in order to show the possibilities of the Beardsley electric for touring and general use. That the last day of the tour should have shown the longest mileage of any day goes to show that the day-in-and-day-out test apparently makes no difference in the mileage capacity of the car.

When the car rolled into the garage on the tenth night of its test, with a record of 117 miles to its credit, the Beardsley Electric Company decided to continue the tour for several days, and in order to impress upon the public the fact that the remarkable record was not the result of expert driving, various owners of Beardsley electrics were invited to drive the car during the balance of the tour. The purpose in this is, of course, to show that any average driver can get a mileage out of an electric and that the record-breaking mileage which Mrs. Beardsley made was not unusual.

New York Gas Company Installs Electrics

The Consolidated Gas Company of New York has in service in its fitting department fourteen one-ton electric trucks. Their operation has been successful and has resulted in a material saving in the carriage of stoves, meters, pipes and fittings, and in the conveyance of fitters to their work on the district. The traveling time of fitters has been cut down by the use of these vehicles, so that fewer men are required than formerly to perform a given amount of work.

In August, 1914, thirteen additional one-ton electric trucks were purchased, which, together with those in service January 1, 1914, were sufficient to perform all of the fitting department transportation except during extraordinarily busy periods.

These twenty-seven trucks have displaced fifty-two horse-drawn vehicles, seventy-seven horses and twenty-five drivers.

Electric Vehicles in Municipal Service of England

An Abstract of a Comprehensive Report by the English Electric Vehicle Committee

ELECTRIC battery vehicles are eminently fitted for employment. In practically all cases of municipal service, since the work to be done lies almost entirely within the proper sphere of this type of vehicle, namely, short-distance haulage at moderate speeds. The mileage capacity for a charge is sufficient for almost every duty which the municipal vehicle has to perform, and, moreover, it can easily be increased by means of a high rate boost taken during the day. The main reason for urging the adoption of electric vehicles by municipalities is the degree of economy which attends their use in substitution for horse haulage. There is plenty of evidence of this statement in the experience of municipalities in this country. In Glasgow the first electric truck employed which was of one ton capacity did the work of two horses with saving expense and greater efficiency, while compared with a gas truck previously employed the saving of about \$1,200 per annum was effected. The durability of the electric vehicle is another feature in its favor and experience in the United States has shown that 10 years at least can be obtained from an electric. The reliability is such that the average working days of the year for an electric is about 97 to 98 per cent of the maximum possible. Apart from economy a municipality should not lose sight of the influence that the electric may have upon the health of the population and the amenities of the locality. An immense improvement could be effected in any city if every self-propelled vehicle were of the electric battery type. For those municipalities that own electric supply undertakings there is the further and very pertinent reason for urging the development of the electric in that the general use of electric vehicles will add greatly to the revenue of the electricity undertaking. The electricity department should employ every possible means to build up the electric vehicle business, and to do this every possible use of the electric in municipal service must be made. An undertaking that wishes to develop its business but yet employs horse or haulage or petrol motor transport for its own work is on a par with an electric supply undertaking that lights its generating station and offices with gas. Apart from the economical and advertising value of the electric vehicle, there are many special advantages obtained by employing the electric. For breakdown work it is invaluable as it is ready to go out at a moment's notice, and it is so simple to drive that almost anyone can take it out. The permanent driver can be a mere youth and this has the advantage that it attests the ease and simplicity of the control.

Delivery trucks are now in use or on order by the electric supply departments at Glasgow, Edinburgh, Derby, West Ham, Croydon, Blackburn, Bootle, Hereford, Ipswich, Grimsby, Brighton, Wolverhampton, Southampton, Liverpool and the Borough Councils of St. Marylebone, Stepney and Poplar. The truck at Glasgow is a covered one of 1-ton capacity, fitted with an Edison battery. The vehicle has been in constant use since August 6, 1913, and up to April 28, 1915, had covered a total mileage of 22,284 with an energy consumption of 13,752 units, including battery losses, which is equivalent to 0.62 unit per vehicle-mile. New tires have recently been fitted in substitution for a set which had done over 11,000 miles. The truck being to some extent an experimental

BY F. AYTON

vehicle, the cost of maintenance and repairs includes some items which are really improvements. The result of the use of this 1-ton truck, in the way of economy and reliability, were so convincing that the department had no hesitation in taking a further step in the general adoption of electric vehicles by placing an order for three more vehicles of $\frac{1}{2}$, $1\frac{1}{2}$, and 3 tons' capacity respectively, which have now been delivered and will shortly be at work.

The vehicle at Brighton is a two-seater car used by the engineer and manager of the electric supply department for business purposes, including journeys to the power station, a little over 4 miles outside Brighton. Its speed is about 16 miles per hour on the level; weight $22\frac{1}{2}$ cwt., average daily mileage 25; while the energy consumption is about 0.5 unit per mile. At 2 cents per unit this is only about 1 cent per mile. The vehicle has run close on 1,000 miles at the time of writing, and, so far, beyond the cost of cleaning, it has cost nothing for maintenance, the tires showing little or no signs of wear. The battery is of Tudor make.

The West Ham electric supply department's vehicle has a carrying capacity of 1 ton, is fitted with a float body, and is used for general carrying work. It was put into service on November 21, 1914, and up to March 31 had covered 1,788 miles with a consumption of electric energy of 0.5 to 0.6 unit per mile. Here again we have, at 2 cents per unit, a power cost of about 1 cent per mile. The battery is an A 6 Edison.

The St. Marylebone electric supply department truck is of the covered type employed in the general delivery work of the business. It is fitted with a Hart battery. The vehicle weighs $34\frac{1}{2}$ cwt., has a speed of about 13 miles per hour and consumes 0.61 unit per mile. Up to the beginning of April the total mileage had been about 5,000, while the whole expense of operating it, including driver, sundry repairs, licenses, insurances, etc., amounted to \$340.

The vehicles belonging to the Croydon undertaking is a two-seater runabout fitted with an Edison battery. There is a third seat which may be used if required. The car is used by both the distributing engineer and the sales superintendent, and during the five months in which it has been in use it has given no trouble; the expenditure in repairs and general upkeep has been nil. The total mileage covered in this period has been 2,156 or an average of 24 miles per day. The borough electrical engineer, A. C. Cramb, gives the following interesting figures as to the cost of operation, the cost of tires being based upon the assumption that an average of 5,000 miles will be obtained before they require renewal, there being ample justification for this assumption in view of the very small wear so far observable.

	Cents	
<i>Running Costs.</i>	<i>Total Cost.</i>	<i>Per Mile.</i>
Electric energy at 2c per k.w. hr..	\$20.97	1.020
Oil and grease .....	.22½	.014
Washing, cleaning, etc.	15.83	.776
Tires (\$175 per set for 5,000 miles)	72.90	3.320
Total running costs .....	.....	5.130

Depreciation—

		<i>Cents.</i>
Battery (five years).....	\$69.12	3,200
Vehicle (10 years).....	71.70	3.24
		<hr/>
Total fixed charges		6.44
Total cost per mile = 2.89 cents.		

The daily mileage is, of course, somewhat low for such a car, being equivalent to a little over 5,000 miles per annum. A total of 10,000 miles per annum is frequently covered by gas cars used for "about town" work; on such a mileage the total cost per mile would be reduced to 8.3 cents.

Besides their use for delivering goods, answering "breakdown" calls and carrying the supervising officials about from place to place on the outside work, there are other ways in which the electric vehicle may be made use of in the service of electric supply undertakings. They may be fitted with motor-driven winch gear for use in drawing cable into underground conduits; an electrically operated pump may be fitted for clearing water from manholes, while a telescopic tower ladder can be provided for trimming arc lamps and for overhead work generally. Where a motor winch is provided, the addition of a simple derrick enables the vehicles to be employed in the erection of street lamps and trolley posts. Where the generating station is not provided with rail or water facilities for the direct delivery of coal, so that the latter has to be carted away from the railway depot or from a wharf, an electric wagon of suitable capacity should soon pay for itself. The same vehicle could be used for carting away ash and clinker. Considerable use is made of electric vehicles for these purposes in the United States.

In demonstration work connected with the obtaining of new business, the electric vehicle promises to be a useful aid because of the supply of electric energy which it carries with it. By the aid of a flexible cable carried through the front window of the house, from the vehicle standing outside in the roadway, the canvasser will be able to demonstrate before the housewife at home the transcendent utility of the electric iron, vacuum cleaner, the electric fire, electric fan and electric kettle.

COLLECTION OF HOUSE REFUSE.

The collection of house refuse is work which is particularly trying for the ordinary steam or gas-motor vehicle, on account of the many stops and starts. The well-known advantages of the electric for this class of work are dealt with, the chief points mentioned being easiness of starting and stopping and the absence of any waste of power during stops. It should be obvious that in the replacement of horse-drawn wagons by motor vehicles, the latter will show the best results where the refuse destructor is at a distance from the area of collection, the savings, of course, being in the higher speed at which the motor vehicle can traverse this distance, and its greater carrying capacity. It is quite possible, on this account, that, in some towns, the best economy might be obtainable by a combination of ordinary horse-drawn vehicles for the districts in propinquity to the destructor, with the use of electric trucks for the districts further away. Possibly in the latter districts, also, the local collection could be best done by horse vehicles conveying the material to a central depot from whence it would be transported to the refuse destroyer by large electric vehicles. An arrangement of this latter sort has been in successful operation in a large Continental city for some time. The horse carts are provided with removable box

bodies, so that when the cart arrives at the depot, the body is lifted off it by an electric crane, and placed upon the flat platform of a large electric vehicle which, when it has received its full complement of these full boxes, proceeds on its journey to the destructor. In the meanwhile empty box bodies are placed upon the tumbrils which once more proceed upon their rounds of collection.

An alternative method to that described above is the employment for local house-to-house collection of a special type of small electric vehicle with tipping box body. In this machine, which has the advantage of possessing a low body, there is no seat for the driver; the latter stands upon a driving platform a few inches from the ground. The saving of time in getting on and off the vehicle, when compared with the ordinary type of vehicle, is obvious. For districts some distance from the destructor these small wagons could tip into a hopper, at a district depot, from which large capacity electric vehicles could be loaded for transit to the destructor, or the small vehicles could have removable bodies which could, by means of a crane at the district depot, be placed direct—several of them—on a large vehicle for the same purpose.

Electric vehicles have been employed to a considerable extent on the Continent for refuse collection. The largest installation is in Paris, where the municipality possesses a fleet of 100 electric refuse collecting vehicles. The total load of the full vehicle is not less than 5 tons. The vehicles perform their work during the night hours, each covering about 25 miles nightly, with an energy consumption per vehicle-mile of from 1.5 to 1.7 k.w. hours. This system of collection was adopted as the result of a very careful trial made by the civic authorities which showed that considerable economy would be obtainable by the use of electric vehicles.

Reference is made to the reports of trials made to the Barnes and the Heston and Isleworth District Councils for vehicles for refuse collection, in both of which cases the result was the purchase of electric trucks.

AMBULANCE WORK.

By reason of its smooth and silent running, the uniform and jerkless acceleration, the electric is an ideal vehicle for ambulance work in our towns and cities. It has for some time been employed for this purpose by the City of London Corporation, by the Port of London Authority and the Metropolitan Asylums Board. While the advantages just now mentioned are all important ones for this sort of work, the feature of economy should not be forgotten; while the promptitude with which calls may be answered is just as valuable an attribute as in the case of fire brigade service. The simplicity of operation also enables several ordinary attendants to be trained to drive, so that a call may never find the truck in want of a driver.

In regard to the city police ambulances the electric motor ambulance service was commenced in May, 1907, with one electric ambulance. In May, 1909, a second ambulance was obtained, and both have since proved very satisfactory indeed for removing cases of accident or illness in the streets to hospitals. The initial cost of the ambulances, with surgical fittings, was, approximately, \$2,845 and \$2,760 respectively, and the total cost of the service is, approximately, \$10,000 per annum. The cost of working is about 10.2 cents per mile, including expenses such as tires, necessary repairs to cars, charging for batteries, etc., but excluding wages and rent. Tire costs account for about 5 cents in the cost mentioned per mile.

The Port of London Authority possesses four electric motor ambulances, and these have been in use since September, 1912.

Electric ambulances are also in use in the United States. The New York Hospital, for example, has seven such vehicles.

FIRE BRIGADE WORK.

Electric battery vehicles have been in use to a considerable extent for fire brigade work. Notable examples of their use are to be found in London and Liverpool; while, up to the outbreak of war, they were known to be employed in several Continental cities, one having no less than 24 in use. Several towns and cities in the United States employ electrically propelled fire engines and escapes, and there can be but little doubt that electric battery traction offers special advantages for fire brigade work, which may be summarized as follows:

Ease of Operation and Promptness of Action.—Unlike the gas-driven type, there is no preliminary starting of the engine before the vehicle itself can be got on to the move. All that is necessary with the electrically driven type is for the driver to get on the seat, throw on his brake, move the controller and the vehicle is under way. That this feature secures a promptness in answering calls is fully confirmed by the experience of the London Fire Brigade, which possesses a total of 15 electrically propelled vehicles, the oldest having been put into commission in 1911.

The Liverpool Brigade has had four electric vehicles in use since 1907—a period of some eight years. Three of them weigh about 6 tons, while the fourth scales $2\frac{1}{2}$ tons; all four have a speed of 20 miles per hour on the level, and a mileage capacity of one charge of 30. Alex. W. Weir, the chief superintendent of the brigade, writes in regard to these vehicles:

They have given every satisfaction, and are inexpensive to run, the cost working out at 5 cents per mile. The main features which commend this class of machine for fire brigade work are the practically instantaneous starting; rareness of failure on the road; the ease with which defects may be remedied in consequence of the fewness of the working parts; the ease with which the vehicle may be driven, and the short time in which a man can be taught to drive.

Statements made by the engineers of fire brigades in America relating to the reliability of electrically-driven engines and escapes under the most adverse conditions show that the electric is ahead of any other form of traction in this respect.

Lieutenant-Commander Sladen stated that, in the London brigade the electrically-propelled appliances cost, on the average, about 25 cents per mile to maintain, this figure not including drivers' wages, capital charges or depreciation, whereas the similar figure for the brigade's gas vehicles is 31 cents. He also went on to say: "When one takes into account the first cost and the depreciation, the cost of maintenance of an electric ladder wagon and of a gas ladder wagon are about the same—namely, about \$750 a year, allowing for interest and depreciation. The annual cost of repairs for an electric ladder wagon that runs about 800 miles per annum is \$200, that is allowing for renewals of batteries and so forth.

Further information supplied to the committee in May of this year shows that the cost of repairs to accumulators for the previous 12 months worked out at an average price of \$120 per vehicle, including a complete renewal of one battery and extensive replacements to three others. As to speed, ample can be obtained; vehicles for this purpose have been built to run up to 30 miles per hour, and, as a set-off against this feature have, of course, a correspondingly smaller radius of action on one charge, usually from 30 to 35 miles. The vehicles of the London brigade can run up to 27 miles per hour on the level, while up a gradient of 1 in 19 the speed is 15 miles per hour.

No difficulty has been experienced in converting horse-drawn steam fire engines and other fire-fighting apparatus, the application of the front wheel drive to which the electric motor so readily lends itself, making the problem quite an easy one. This method of driving is also claimed to have the further advantage of avoiding the risk of skidding to a considerable extent.

UPKEEP AND CLEANSING STREETS.

The electric vehicle is in use on the Continent and in the United States in connection with street cleaning and brushing machines and for watering, one important Continental city having about 30 in use. In the city referred to, each electric truck waters about 49,000 square yards of road surface per day of eight hours, as against 30,000 yards, the best average of a horse-driven type. The saving stated to result from employing electrics in place of horse-drawn trucks for this purpose by the municipality mentioned is about \$400 per electric type per year. The electric vehicle is also employed for carrying materials used in the making and repair of roadways, and a 3-ton wagon with tipping body has just been put into service for this purpose by the Corporation of Ipswich. In reality, this wagon will be a "double-purpose machine," since the tipping body is removable, and can give place to a water-tank (which is now being constructed) to enable the vehicle to be used for street watering.

It has been suggested that an electrically driven road roller would be an improvement upon the noisy steam roller generally in use. Although, as far as the committee's knowledge goes, no electrically propelled rollers have yet been introduced, there appear to be obvious advantages in that method of working and no difficulties in applying it. As weight is an essential requirement, a battery of as large a capacity as necessary could be fitted.

It is satisfactory to be able to chronicle that there are now three municipal street car companies making use of the electric battery 'bus as an adjunct to their tramway services—i.e., Southend-on-Sea, South Shields and York. In all three instances, it is understood that the vehicles are giving satisfaction.

The vehicle which the Southend Corporation Tramways Department has had in use since June 26, 1914, is similar to those employed at West Hartlepool. The experience at Southend, however, is perhaps a little more valuable for the reason that other buses of the gas and gas-electric type, and of the most modern make, have also been in use alongside the electric bus. As to cost of operation, after eliminating from the cost ascertained up to date certain items in connection with each type of bus which are incidental to the inception of a 'bus service, Mr. Birkett gives the actual average cost per bus mile (including capital charges) for each type as follows:

Gas	17.12 cents
Gas-electric	16.62 cents
Electric	15.04 cents

Mr. Birkett further points out that, in his opinion, the results would be still further in favor of the electric battery bus if a fleet consisted entirely of the latter. The consumption of energy on the hilly route is at the rate of 1.55 k.w. hours per mile, while on a route which is more or less level, the figure comes down to 1.1. The bus receives a short boost while waiting at one terminus, the boosting current being about 300 amperes. The average speed including stops, is about nine miles per hour. Up to date there have been no repairs needed to the electric vehicle.

The Ilford Council Tramways Departments employ an electric tower wagon which has now been in service

for over 12 months. The electric vehicle for this work possesses several special advantages.

Another use of the electric is in the emptying of cesspools. It is possible to construct an electrically propelled vacuum tank wagon—the usual capacity required is about 350 gallons—fitted with an electrically driven air pump. As such a pump will only need some 2 h.p. to drive it, the ordinary size of battery such as fitted to a 3-ton wagon, would easily supply the energy required while the wagon is standing. The advantages would be that ordinary laborers could work the plant, the cost of working and up-keep would be small, and the plant would operate with absence of noise.

England Uses American Electrics

Since the war has necessitated the commandeering of the majority of available horses and gasoline vehicles for the troops English merchants have installed electric vehicles to take the places of those of which they have been dispossessed and in the same way the English bus companies have filled their gaps with numbers of electric buses, importing from America for this purpose, and now that electric vehicles have been given this opportunity of demonstrating their efficiency they have made good and promise to hold their place in the future.

Electrics Popular in Pittsburg

That electric vehicles are becoming quite popular in Pittsburg may be shown by the fact that the number in use there has, in the last year, increased over 32 per cent.

The average automobile enthusiast is not acquainted with the fact that electric automobiles are being successfully and satisfactorily operated in the Pittsburg district. Such is the case, however, for at the present time there are over 300 pleasure cars and a number of commercial trucks in daily service in the Pittsburg district, practically all of which have been sold in the last few years.

The electric pleasure car in Pittsburg is said to have a daily average of about fifty miles on one charge of its battery, while the commercial cars average about 35 to 45 miles per charge.

Electric Trucks Reduce Terminal Congestion

Handling what traffic men call "broken lots" is a big problem for the railroads. In Boston the New York, New Haven & Hartford Railroad Company has overcome to a very considerable extent this problem by the use of heavy duty electric trucks, using them for transferring freight from inward to outward freight houses. They are a great assistance to shippers and receivers in the expeditious handling of such freight.

Previous to the installation of these trucks the railroad was using about 47 shifting cars, which were charged up to the freight department at 45 cents each per day, or \$21.15 per day. They now use one "shifter" at 45 cents. The trucks go between houses that are from one-fourth to one mile apart.

Previous to employing the trucks, the work was as follows:

Inward freight was unloaded from car to freight house; later the shifter switched in and above load, loaded into it, together with other goods for outward points. The shifter was then switched to the outward

freight house, where the car is unloaded and sorted; then shipments are loaded into car for point of destination.

With trucks the inward car is unloaded and the outward-bound goods left near the door. Then the truck takes the load to the outward freight house, where it is loaded directly into a car for its point of destination.

Each truck has a driver, a checker and two freight handlers at present. The management is considering having only a driver and checker on the truck and having the freight handled by the men at the respective freight houses.

These trucks have a loading space of 6x15 feet with stakes, side opening, high seat and three bow hoods. They are equipped with Edison batteries. With the above loading space on mixed freight, the trucks carry from 9,200 to 10,000 pounds conveniently. They are handling about 75 tons per day, with a mileage per truck of fourteen.

The management is considering in the near future transferring between the Congress street and the North station, a distance of about two miles, provided the present proposition continues to work out satisfactorily. They are to garage and care for these trucks themselves, also charge from their own charging plant.

The first two General Vehicle trucks were placed in service November 1, 1913, and so far their mechanical upkeep has been less than one dollar per month.

E. V. A. Secretary to Make Extensive Trip

The Electric Vehicle Association of America has authorized its secretary, A. Jackson Marshall, to make an extensive trip for the purpose of carrying the propaganda of the association for co-operation, in order that the electric vehicle may receive the recognition to which it is entitled.

Fourteen sections or branches of the association already have been organized, and it is the aim of Mr. Marshall to have a number of other sections get together and affiliate with the main organization. Columbus, O.; Cincinnati, Louisville, St. Louis, Kansas City, Omaha, Denver, Salt Lake City, Los Angeles, San Diego, San Francisco, Portland, Seattle, Spokane, Minneapolis and Chicago will be visited during the trip.

Charging Apparatus For Summer Resorts

Charging stations for electric pleasure or business cars will be established at Coeur d'Alene and at Hayden lake by the Spokane & Inland Empire system, Spokane, Wash.

The establishment of the stations is due directly to the work of W. K. Stacey of the Electric Motor Car Company, Sprague and Jefferson, who has interested the railway officials in the idea.

The plan will make it possible for owners of electric cars to make the trip from Spokane to the lake without fear of being stalled along the road.

Hearses Not Subject to Overweight Charges

Attorney General Wescott recently ruled that hearses and ambulances are not commercial trucks and are not subject to overweight charges. The attorney general has also ruled that automobiles owned by the United States Government will not be required to pay the regular license fee.

PERSONAL NOTES.

The Waverley Company, electric vehicle manufacturers of Indianapolis, announce the retirement of President Wm. B. Cooley and the promotion to the presidency of Herbert H. Rice, former vice-president. Mr. Cooley expressed, some



Herbert H. Rice.

time ago, a desire to withdraw from active business, and the change made May 15 consummates his wish. The financial strength of the company will not be impaired by the change. New financial support has, in fact, been gained that solidifies the already substantial foundation of the company's prosperity and gives every reason to expect a considerable expansion of its business in the near future. The retirement of Mr. Cooley will be regretted by his many personal friends in the trade, but the company's well-wishers must rejoice that its management will be in the hands of so capable a successor. Everyone who knows Mr. Rice will realize that with his promotion to active control of Waverley affairs new energy and vitality will be infused into all departments of this important industry, and the considerable business successes the Waverley has achieved in the past will be added to and surpassed in the future. Mr. Rice has had an enviable business career. Graduating from Brown University in the class of 1892 he received his training with Colonel Albert Pope in the early days of the bicycle business and was advanced under his inspiring leadership from one important post to another until, in 1904, he was sent to Indianapolis to take charge of the Waverley factory, then recently acquired by the Pope Motor Car Co. About the same time, Wilbur C. Johnson, also of the Pope Company, joined the Waverley branch and he now becomes vice-president of the reorganized Waverley Company. These two men worked together in the manufacture and sale of Waverley electric automobiles, building up the present extensive plant and business from comparatively small beginnings. In 1908 they together organized the present Waverley Company which purchased the factory and good-will from the Pope Motor Car Company, and have actively co-operated in the management of the business since that time.

Both are men of optimistic temperament, coupled with sound business judgment, and both look forward to the rapid advance of Waverley interests by their continued united efforts, maintaining the Silent Waverley Electric in its established place of leadership in the electric motor car industry. They have given much of their time and energy to the promotion of the interests of the industry as a whole, having been officers and active working members of the Electric Vehicle Association of America and the Electric Vehicle Manufacturers Association. Mr. Rice is now serving his second term as president of the National Metal Trades Association, was formerly treasurer of the National Association of Automobile Manufacturers, and is now a director of the National Automobile Chamber of Commerce. Mr. Rice has found time out of his busy career to give much attention to civic activities in Indianapolis, having been president of the Indianapolis Manufacturers Association, director of the Indianapolis Trade Association and of the Indianapolis Chamber of Commerce, a member of the Board of Trade and other civic and social clubs. He is active in church affairs and in the promotion of local musical interests. One of his favorite diversions is tennis. He plays regularly in both state and interstate tournaments of tennis players. An all-around, many-sided man of numerous activities and generally high efficiency, the Waverley Company is to be congratulated on his leadership.

The Electric Motor Car Company, 1215 Fourth avenue, Cedar Rapids, Ia., representatives of the Detroit electric, formerly a partnership, consisting of W. E. N. Taylor and R. E. Lawhon, have dissolved the partnership, and the business will

be continued under new management.

W. E. N. Taylor will retain the agency for the Detroit Electric.

J. A. Magill, Milburn electric salesman of Detroit, has joined Ben B. Hood, assistant salesmanager of the Milburn Wagon Company of Toledo, Ohio, in assisting the Cartwright Motor Car Company, Milburn electric distributor in St. Louis.

The Associated Garages of Chicago, a new organization, composed of the Chicago Garage Owners' Association and the Electric Garage Owners' Association of Chicago, announces the appointment of Frank E. McCall as its permanent secretary.

Mr. McCall has well earned the reputation of being one of the most enthusiastic and really result producing workers in garage circles of Chicago. His exceptionally adaptable electrical training in various central station departments especially in those departments closely allied to the electric vehicle and garage industries has made it possible for him to become an authentic and prominent factor in recent promotion and development.

Graduated from the University of Nebraska in electrical engineering, Mr. McCall immediately entered into central station work in the employ of the Municipal General Electric Company, Minneapolis, Minn. Later as power engineer, Mr. McCall became identified with the Cosmopolitan Electric, which in turn was absorbed by the Commonwealth Edison Company. With the latter concern he has specialized in the promotion of electric vehicles and electric garages, from which he has acquired a splendid training in the study of transportation problems, charging facilities, etc.

In the last two years Mr. McCall has served as secretary of the Chicago section Electric Vehicle Association, and has become a celebrity in the electric vehicle industry.

As secretary of the new organization, it is to be expected that he will figure prominently in development in the interest of garage men.

Another cog has been added to the already efficient selling staff of the Chicago branch office of the Anderson Electric Car Company. Lee Stevenson, formerly Chicago manager of the Fritchle Electric Car Company of Denver, has accepted a position distributing "Detroit's" in Chicago territory. Mr. Stevenson is well versed in selling electric passenger cars, having secured his training first in the actual construction departments and later in the highest sales departments. Ambitious, forceful and conscientious, his wide range of training makes him efficient and competent to introduce to the masses of automobile enthusiasts in Chicago the desirability of the electric. The larger electric vehicle using centers are badly in need of trained and efficient men in the field and the Chicago industry can well be proud of his latest selling assistant.

Auto industry of Chicago, consisting of the Chicago Garage Owners' Association, Electrolytes and Chicago section, Electric Vehicle Association contemplate holding an annual united outing at Cedar Lake, Ind. The organization will convey all guests to the lake by automobiles, and it is expected that a general good time, including games, boating, dancing, etc., will be in plenty.

George H. Kelly, secretary of the new electric car industry merger, The Baker R. & L. Company, was elected president of the Electric Automobile Manufacturers' Association at the annual meeting in Cleveland, held recently, to succeed L. E. Burr, of The Woods Company. With Mr. Kelly's business ability and activity the association should have a most interesting year. Mr. Kelly is thoroughly familiar with all the details, needs, purposes and aims of the electric vehicle industry. His aggressiveness will do much to promote the electric vehicle.

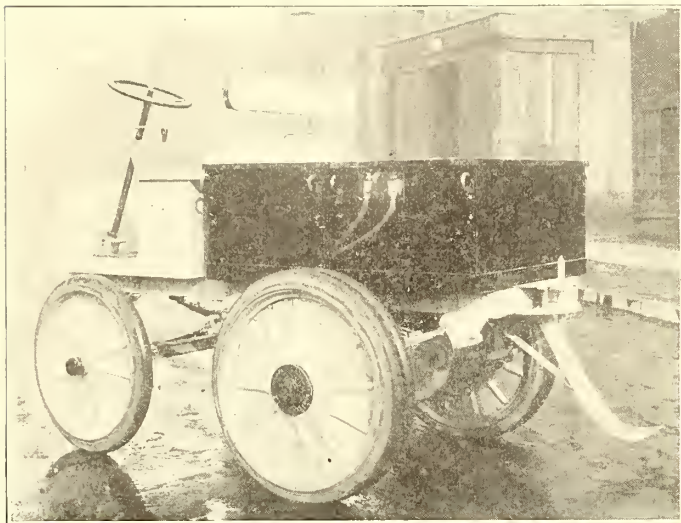
The Polack Tire and Rubber Company has established a branch office in Cincinnati, O., in the Union Central Bldg. A completely equipped service station was also established. The company's business is in charge of J. M. Briceland.



Frank E. McCall.

Walker Builds Tractor

The Walker Motor Vehicle Company, Chicago, prominent manufacturer of Walker electric commercial vehicles and the popular Chicago electric, announces a new and powerful electric tractor.



Walker Electric Tractor.

The new power apparatus is equipped with an Edison battery and is said to have enormous pulling power.

Tractors are used by large factories, lumber mills, steel mills, stone quarries, especially where heavy matter is hauled.

The Walker company feels that there is a big field for the electric tractor and it will be introduced and manufactured on a large scale.

Boston Motor Club Merges With E. V. A.

A meeting of the Electric Motor Car Club of Boston was held at the Hotel Thorndike May 20 with about 30 present. President L. D. Gibbs referred to the recent death of Don C. Tiffany as a distinct loss to the industry. The deceased had been active in the promotion of electric vehicle interests for many years. Resolutions in recognition of his services were read by Secretary C. H. Miles and were adopted by a rising vote.

Mr. Gibbs stated that it had been thought best to consolidate the activities of the club with those of the New England section, Electric Vehicle Association of America, since the two organizations followed parallel lines of work. It was, therefore, proposed by J. S. Codman, for a committee which has had the matter under consideration, that the Motor Car Club suspend its regular meetings, continuing its present officers until their successors are elected. These suggestions were acceptable to those present, and will be formally acted upon at a future meeting, when amendments to the con-

Washington Holds Large Size Truck Exempt

Through an error of the recent legislature, there apparently is no legal authority for collecting any license fee whatever from a motor truck of more than 5 tons capacity, though a license for a truck of four to five tons costs \$25 if privately used or \$50 if for hire in Washington.

This is the highest class mentioned in the new motor code, which became effective June 10. When the motor code was originally drafted it was intended

by a separate act to bar from the highways trucks of more than five tons. This measure was amended, however, to make the limit six tons, and the legislature forgot to change the provision in the motor code.

England Forced to Use Electric

The electric commercial vehicle has proved a boon to London's transportation difficulties because of the war. At the beginning of the war all the best gasoline trucks, horses and wagons in London were taken over by the government for army use. The firms who had been employing this means of distribution for their products were absolutely at a standstill. As soon as they would buy a new truck or a new team of horses to replace those already confiscated, the government would immediately have need of them.

Manufacturers had a man in London at that time endeavoring to open connections for the sale of electric trucks. London was slow to accept the new method of transportation, but it was apparent that the electric truck was useless for duty at the front and one or two firms were persuaded to try this means for overcoming their difficulties.

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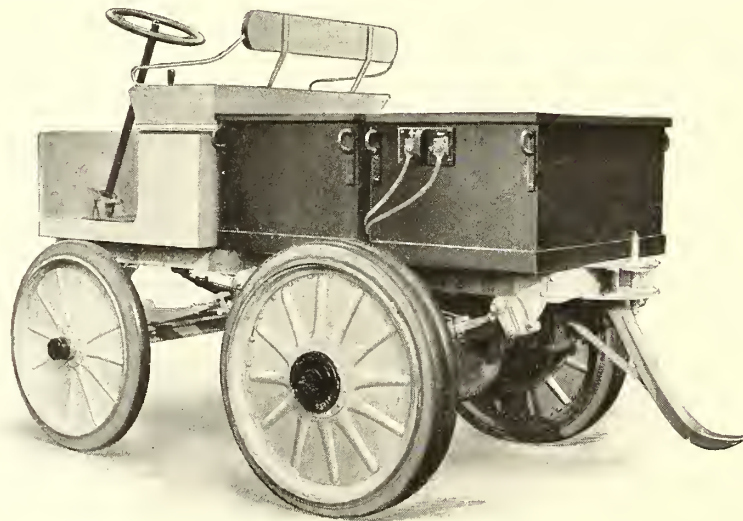
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Vol. 7

CHICAGO, AUGUST, 1915

No. 2



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Detroit Electric

Doubled output for 1916 reduces prices as low as \$1975

August 15 we reduce the price \$600 to \$725 per car

Remember — these are the same high quality cars as our 1915 models plus a score or more of 1916 refinements. Even while lowering the price, we bettered the car. In the 1916 Detroit Electric, you will find — we believe — the top place car of its type. We urge you to match it — if you can — in elegance, quality, utility, or value in the entire closed car field — gasoline or electric. This price reduction is possible only because of doubled output.

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and learn why the 1916 Detroit Electric is the preferable car for you.

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F. O. B. Detroit

Model 61 4-Passenger Brougham	(Formerly \$2,600) — Now \$1,975
Model 60 5-Pass. Duplex Drive Brougham	(Formerly \$3,000) — Now \$2,275
Model 59 5-Pass. Rear Drive Brougham	(Formerly \$2,950) — Now \$2,225
Model 58 5-Pass. Front Drive Brougham	(Formerly \$2,950) — Now \$2,250
Model 57 4-Pass. Rear Drive Brougham	(Formerly \$2,850) — Now \$2,175
Model 56 3-Pass. Cabriolet	(Formerly \$2,650) — Now \$2,075

You may have either the worm bevel or the worm gear, wire or wood wheels, cushion or pneumatic tires, as optional equipment

Increased Efficiency — Hence — 15,000 Mile Battery Guarantee
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Volume VII

CHICAGO, AUGUST, 1915

Number 2

Electric Roadster Tours to Cedar Lake

Walker Vehicle Company Tests Latest Roadster Model on Cross Country Run

THE general public has long been misled as to the true purpose and utility of the electric passenger car. Many have accepted it as a town car—ideal only for short trips or well kept boulevards reasonably close to charging stations.

Although the electric car is primarily a vehicle for city driving, its many developments in construction and mechanical arrangement have made it a vehicle capable of covering long distances under most trying conditions.

It is not the intention of electric car manufacturers to exploit the electric as a vehicle appropriate for touring, but it is their desire to prove to the skeptical public that the electric is appropriate for the average day's mileage demand, even for users accustomed to the gas car.

GAS CAR TIME TO CEDAR LAKE, IND., MADE BY CHICAGO ELECTRIC ON ROUND TRIP OF 88 MILES.

W. J. Burns of the Philadelphia Storage Battery Company and C. H. Kinney, superintendent of service of the Walker Vehicle Company, manufacturers of Chicago electrics and Walker trucks, proved their confidence in the ability of the modern electric car to satisfactorily cover country touring by braving rain, mud and slow roads with a Chicago electric cabriolet roadster Thursday, July 29. The occasion of this trip was the annual outing and picnic given by the Chicago Garage Owners' Association, Electric Vehicle Association, Electrolytes, Chicago Motor Livery Association, and the Illinois Tire & Accessories Dealers' Association.

In addition to the great number of gas touring cars scheduled for the trip, a number of electrics were expected to make the run, but because of the bad weather and slow condition of the roads but one electric car attempted the trip.

All cars were checked out at the Fashion Auto Station, the time of their departure being marked on a card, this same card being stamped on their arrival at Cedar Lake. A

committee of arrangements set a running time for the trip, which was not announced until after the arrival of all cars, after which the time cards were collected and compared with the secret running schedule to determine who won the prize. The running time set by the committee was two hours and twenty minutes. The first prize was won by J. H. Delaney of the Adams Electric Garage, who drove a gas car, and the second place was tied by Dennis Nolan of the Fifty-third Street Auto Station and G. R. Walker of the Walker Vehicle Company. The Chicago electric took the prize for the electric car section.

The Chicago electric running time was two hours and thirty minutes, which was within ten minutes of the time set for the large gas cars. Considering the average speed which could be made on the slow roads, this record of the electric proved very surprising to every one and indicated clearly that while the maximum speed of the electric under the best conditions was only twenty-five miles an hour, it is wholly possible to cover long distances at an average conservative speed and still arrive at the destination in practically as good time as the high-powered gas cars. It proved to every one's satisfaction that high speed is not necessary to make good schedule time.

The electric car was a standard model roadster with standard equipment of a 42-cell Philadelphia battery, using the famous Diamond Grid plates. Upon arrival at Cedar Lake the odometer read 44 miles,

indicating an average speed of practically 18 miles per hour. The running time on the return trip was made in two hours and thirty-five minutes.

This particular model is built with a special view to mileage and service, designed primarily for practical purposes, having a special appeal to men who want speed and reliability, minus the troubles and expense of a gas car.

This is but one of the many long distance trips which have been made by electric cars with perfect success.



Chicago Cabriolet Roadster Which Completed Tour.

Reduction in Detroit Electric Prices

Anderson Electric Car Company Doubles Production, Offering Some Models as Low as \$1975

A SENSATION was created throughout the entire electric car industry when the Anderson Electric Car Company announced on August 12 that the new prices on its 1916 models would range from \$1,975 to \$2,275. Although from time to time there have been low-priced electric cars placed on the market, the Anderson Electric Car Company is the first prominent manufacturer of a high-grade car to make any gigantic reduction in price. Notwithstanding the fact that the reductions are from \$500 to \$725, the quality of the new cars will not be cheapened in the slightest particular, according to W. C. Anderson, president of the Anderson Electric Car Company. The 1916 cars embody a number of refinements typifying the latest practices in automobile engineering. Many of these improvements are exclusive with the Anderson company. These 1916 Detroit models typify the experience gained during nine years of building the finest quality electric enclosed cars produced.

It has been found necessary to double production in order to meet the demands dealers have received. This greatly increased production permits of so many marked economies that the company has been able to announce these prices without departing from the standard of quality that Detroit electrics have long been noted for.

Another noteworthy change in the policy of the Anderson Electric Car Company for 1916 is the adoption of the one-chassis basis production. This one chassis has been brought to the highest degree of perfection that the world's largest builders of enclosed cars can attain and upon this one chassis is built four body styles. The floor space of the plant has been greatly augmented to facilitate and expedite this greatly increased production of vehicles.

The marked reduction in the price of 1916 Detroit electrics greatly widens the range of their sales, and now numbers of people who have heretofore refrained from purchasing an electric car because of the high price of the good makes, need wait no longer, and they should not hesitate in purchasing, because the electric is a practicable automobile in any town having electricity, because of its great power and easy riding qualities, which make it an interurban car as well as a motor for driving about town.

The officials of the Anderson Electric Car Company are looking forward to the next year as one of the best that the electric car industry has ever experienced. The obvious advantages of the enclosed car are establishing themselves more strongly in the favor of motorists with each passing year and the Detroit electric represents the right type of the all year 'round, every day, and all weather car.

A further reason for its popularity is the fact that it can be as easily and safely operated by mother, wife and daughter as by the head of the family and consequently many men figure that they get a greater return for their investment in the Detroit electric than in any other type of car.

This type needs no change of bodies to fit it for use in any season of the year.

In Chicago, especially, where the electric already has been established so firmly, it is expected that the latest price announcement will have a tremendous effect. Owners of gasoline cars will also be interested in the new prices. The recent reduction in high grade gasoline cars together with the reduction in the price of Detroit electric models will permit many to own both a high grade gasoline car for touring and an electric for every day city driving.



Chicago Sales Offices Anderson Electric Car Company.



Detroit Electric Which Successfully Completed Sociability Runs



Roads Leading Into Detroit Proved Ideal for Electric Touring.

Promoting Electric Vehicle Campaigns

Suggestions and Methods Offered by Successful Central Stations in Promoting the Electric

IN THE last six years, the electric vehicle industry has passed through a great period of development. Co-operation from central station companies in our larger cities, wide-spreading promotional influence of such organizations as the Electric Vehicle Association of America, Electric Motor Car Club, Electric Car Manufacturers' Association, National Electric Light Association and various local and national allied garage organizations have assisted most prominently in advancing the industry. Masses of publicity and advertising matter assisted by high grade selling organizations have built up a considerable industry.

Development in every branch has been included in the campaign; and co-operation between the various branches has bound together these many allied interests into a systematical unit.

In spite of the actual interest which has been instigated in the promotion of the electric, the volumes of literature, presentation of papers, advertising campaigns and personal solicitation, many who realize the value of the electric both as a money-maker and as a satisfactory conveyance, are not utilizing its resources purely because they do not know just what methods to pursue in its promotion. This is especially true of smaller central station companies, especially those which have been flooded with literature and personal appeal to "boost the electric." For instance, a small power company, even after being convinced that the electric means a profitable increase in revenue, is unable to determine how to go about getting the vehicles in the territory which it serves.

Believing that these smaller companies may profit by the experience of large and successful central stations with a well developed charging load, the following suggestions are presented to assist those contemplating an electric vehicle campaign.

First Steps in Campaigning the Electric

BY HARVEY ROBINSON, NEW YORK EDISON COMPANY.

A SMALL central station company can promote the electric vehicle industry by purchasing and operating one or more electric vehicles in its own business; closely observing and making a record of performance and operating costs of its own equipment; and compiling this data with similar data secured from other

sources and distributing it among the likely purchasers of motor vehicle equipment in the community.

The control station should appoint one of its power salesmen to specialize on the electric vehicle, making him a source of expert counsellor in charge of an automobile bureau, to which all inquiries may be referred. This man can familiarize himself in a very short time with the different makes of vehicles now on the market and can secure performance and cost data from vehicle manufacturers and other central station companies which now maintain automobile bureaus.

Further making a selling field and list of prospective purchasers attractive to vehicle manufacturers, will soon cause local branches and agencies to be established.

Always speak a good word for the electric. Don't be too conscious of the few small operating faults which may occur. Remember that other forms of motor vehicles, in fact all kinds of machinery, have their moments of failure.

Probably one of the best ways in which to get things going would be to select a man and have him visit two or three other central station companies which are now engaged in promoting the use of the electric vehicle.

The bureau may in the beginning consist of but one man whose position may be dignified by the title "Automobile Engineer" or "Manager Automobile Bureau." All automobile inquiries coming to any other department of the company should be referred to the automobile bureau and the bureau held responsible for the answer given. The bureau should be advertised as a source of information for the general public and an effort should be made to arouse confidence in the ability and willingness of the central station company to supply the service of a consulting engineer free of charge.

Some years ago the New York Edison Company established its automobile bureau, and the man placed in charge was instructed that his duty was to co-operate in every way possible with the electric vehicle manufacturers who were selling in New York territory.

After the bureau became acquainted with all local electric vehicle selling agencies, it set about the task



Progressive Central Stations Demonstrate Electrics in Their Own Service and Thus Develop Large Fleet Users.

of getting in touch with all local users of electrics. A list of all New York City automobile registrations was obtained from the secretary of state, the electric vehicle owners selected therefrom, and listed on cards. A list of customers taking service from the company for charging purposes was next obtained. Calls were then made on all persons whose names appeared on either list, the preliminary record was checked, and a permanent record established. This record is kept on cards which show the name of the owner of the car and his address, the make of the car, where it is garaged, and the source of the charging current, whether Edison service, or a private plant.

This list of vehicle owners is kept up to date by daily reports from the State Automobile Registration Bureau, and whenever a new registration appears the car owner is interviewed, the purpose of the bureau explained and its services offered. The bureau aims to keep in touch with the operation of every electric in the city and, whenever possible, performance and cost data is obtained. A call is made at least once annually on every user in the city.

Owners of cars, and electric vehicle manufacturers were advised by letter that the company had established a bureau, and stood ready to assist in the care and operation of electric vehicles.

The next very important step was the establishment by the company of twenty-two outlet charging stations throughout the city. This network of emergency charging stations covers the city very completely, and it never happens that a vehicle wanting a boost is a too great distance from a supply of charging current.

A booklet containing a list of all garages and charging stations within a radius of 100 miles of New York City is published annually by the company and given wide distribution. Electric vehicles and storage battery manufacturers are advised that they may have as many copies as they may want for their own mailing lists or for their showrooms.

The bureau of the New York Edison Company is now composed of eight people, one of the number being a lady demonstrator, making demonstrations and giving driving lessons in any of the cars offered for sale in the city.

One of the men is an office engineer, who collects and compiles statistics and all performance and cost data he can get hold of. He supplies engineering advice to the service man and salesmen, at times going out on special cases himself.

If the electric vehicle purchaser will permit, the bureau will direct the installation of the necessary garage apparatus, and give advice as to proper maintenance of the vehicle. If the purchaser does not wish to care for the car himself he is supplied with a list of nearby garages where satisfactory service may be obtained. In this manner the service of the bureau is two-fold; first, by arranging garaging facilities for the new car, and secondly, by increasing the business of the garage man who is trying to earn a lower rate.

Another duty of the bureau is to select and maintain a list of New York business houses now using horse-drawn vehicles but whose volume of business handled seems to warrant the adoption of a more economical mode of transfer. This list is circularized at intervals and attention is drawn to the advantages to be derived from the use of electric trucks. A reply to one of the letters being received, a representative

immediately calls and determines the requirements of the case, submitting interesting performance data, and figures on cost of operation and maintenance. He also has with him a list of satisfied users of electric vehicles. With the prospective purchaser's permission, his name is sent by letter to the local representatives of the different electric vehicle manufacturers, with the request that descriptive literature be sent and followed by a salesman. The Automobile Bureau becomes acquainted with the salesmen on the case and keeps in touch with the progress made, giving information where it is wanted on the cost of charging current and the necessary charging apparatus.

The company spends a goodly part of its advertising appropriation on electric vehicle publicity. Space is purchased in both newspapers and magazines, and each advertisement carries the names and addresses of all electric vehicle selling agencies in the city. Copies of our advertisements are always sent to vehicle manufacturers, irrespective of whether they are represented in the city or not.

The central station company should take the lead in the formation of a local electric vehicle association. Meetings might be held monthly, or oftener if desired, and everyone in any way interested, users, prospective users, manufacturers and selling agents, should be invited to hear the reading of papers prepared by competent men and to join in a discussion which may follow. An association may also readily undertake the arrangement of what may be called public demonstrations or publicity stunts.

The "get-together" spirit must be worked up. Interchange of experience and ideas will make far better progress.

It is found in some of the larger cities that there is a deplorable lack of parking space for passenger cars. An association would be better able to procure such a facility than an individual.

It is suggested that electric vehicle workers might find it advantageous to become members of gasoline car organizations. Association with gasoline car salesmen and observance of selling methods will surely be of value and will so acquaint the electric man with the gasoline car that he will know whereof he speaks when he is called upon to match the electric car against the gasoline.

The statement, "We sell not only cars, but service, too," is becoming a sort of slogan among car manufacturers. Service is indeed very important. A number of instances could be pointed to where a sale was lost because the prospective purchaser could not be assured of proper care for the car after he had begun to use it. It is absolutely necessary that a city in which interests are endeavoring to increase the use of electrics, be adequately equipped with garages. Some central stations have increased the local sale of cars wonderfully by establishing and maintaining public garages. Other central stations are perhaps opposed to establishing public garages for the reason that they dislike to injure the business of the already existing garage man, who may be a customer. The fact remains, however, that if the garage man does not properly do his work, and jeopardizes the popularity of the electric car, intrusion is justifiable. It is felt that the motoring public will have much more confidence in a garage maintained by the central station or an association than it would have in that owned by an individual.

You are doubtless all aware of how our larger express companies are rapidly disposing of horses, and enthusiastically buying electrics. These big purchases of the express companies are the result of years of tests and observation while horses, gasoline trucks and electrics have been working side by side. One of the companies with headquarters in New York is now preparing a building which will eventually house in the neighborhood of 400 electric trucks.

While the nation-wide publicity campaign of the Electric Vehicle Association of America has done a world of good, it is regrettable that there has not been more local follow-up advertising. To produce the maximum result a national campaign must be linked up to local effort.

Where there are just a few selling agencies with but very modest advertising appropriations, it is suggested that co-operative advertising be attempted. The local association may be used to collect and expend funds for such purposes. It is apparent that in this way a larger and better resulting spread can be made than if each dealer made his own comparatively weaker effort.

Advertising copy should be couched in the simplest of terms. Some advertisers make the mistake of assuming that the layman knows very nearly as much about the product as the manufacturer himself.

The advertising copy should carry illustrations. Set a picture of a gasoline car chassis, with the gear box uncovered, alongside an electric car chassis, and you have told an impressive story about simplicity of construction. Further on simplicity of control may have an inning. It is advisable that the advertising appear constantly rather than spasmodically.

Much has been said about the desirability of presenting cost data, and it is regrettable that more of this data is not available. It is notable that just a few central stations have overcome their objections to publishing figures, and have won distinction by printing interesting and attractive statements. The fact that operating conditions vary does not materially lessen the value of the data if the conditions are mentioned. If data covering a large number of various operating conditions are presented to a business man, he can select for himself those figures which he thinks will most nearly fit his own case.

Commonwealth Edison Company's Progressiveness

BY FRANK E. MC CALL*

Everyone will agree with us that the electric vehicle is no longer an experiment, if they will consider its past and present accomplishments, and its many future possibilities. Ever since its first development to the stage of practical every day usage, it has been recognized by the majority of central station companies, as the producer of practically the most ideal off-peak station load obtainable. As a consequence, they have needed no further convincing that it is obviously to their best interests to promote the electric vehicle industry in their territory, as far as it is in their power to do so. And primarily, this can best be done by "boosting" the sale and use of all classes and types of electric vehicles along the following lines:

First and primarily, by using electric vehicles in your own business; both passenger and commercial types. It is not reasonable to expect the public to be-

come seriously interested unless you practice what you preach. In addition, by seeing that all your employees consider and speak of the electric vehicle in favorable terms.

Secondly, by offering reasonable and attractive power rate schedules for this class of service. It will greatly encourage its development.

Thirdly, by being sure that a sufficient number of good public electric garages are in operation when needed. Give them your entire co-operation, but do not hesitate to operate garages on your own account if necessary in order to see that the vehicles receive the proper care. Also remember that commercial electric vehicles are, as a rule, operated most successfully in fleets, and therefore do not recommend too hastily private garaging for small installations when public garages are available.

In general where electric vehicle manufacturers are slow about acquiring active and progressive representation in your territory, it will pay to take an agency for both types of vehicles and operate a service station for their inspection and care. But whether you operate an agency or not, always try to the best of your ability to see that all vehicle installations provide for exactly what the work demands; for instance, don't expect a department store to be satisfied if they attempt to make economical house to house deliveries from a five-ton truck.

Always maintain one or more men as electric vehicle specialists, whose duty shall be to keep posted on all phases of the electric vehicle situation. They should acquire a sufficient amount of information concerning all kinds of electric vehicle equipment and its proper operation and care, in order that reliable advice may be given out.

The power company should ever be on the alert and stand ready to perform any of the special requirements within its power, which may be found necessary for the promotion of the electric vehicle in the particular locality. A common example of this would be the establishing of emergency charging stations in the outlying districts.

Advertise the electric. It is marketed the same as any other article. The public will not know about its merits unless we bring it to their attention. Some of the available mediums are, newspapers, magazines, billboards, theatre programs, and enclosures with electric light and power bills. At the start, any company can well afford to spend a goodly portion of their total advertising appropriation until the electric vehicle campaign is well on its way.

Co-operate with the Electric Vehicle Association of America and other organizations pertaining to the electric vehicle situation, thus keeping posted on all activities. It is the only way whereby you can gain your share of the benefits of the excellent work performed for the advancement of the industry.

And lastly invariably make it an effort to see that the public is educated in the proper use of electric vehicles as regards economy and cost. This can be done best by distributing information relating to the maintenance cost, and the amount of energy required to operate electric vehicles under various conditions. One very successful method employed for showing the actual conditions to the car owner is to furnish blank record forms and let them keep "tab" on themselves for a month or two, thereby proving the equalities demanded by this type of vehicle.

The Commonwealth Edison Company, Chicago,

*Electric Vehicle Engineer, Commonwealth Edison Co.

is reputed as being one of the most progressive power companies in the world.

Through systematic organization, electric vehicle bureaus and vehicle engineers, it has built up a charging load which represented in 1914 a total revenue exceeding \$300,000.

From the very first this company has looked with great favor on the electric vehicle industry as a very valuable field for central station service and has endeavored to build up this class of business.

At the present time the work being carried on could be classified in the following divisions:

- (1) General publicity.
- (2) Favorable rates for battery charging.
- (3) Personal services of specialists available to electric vehicle users and prospects.
- (4) Co-operation with electric garages.
- (5) Maintenance of emergency charging stations.
- (6) Taking a substantial part in the activities of the Electric Vehicle Association of America and various other allied societies.

GENERAL PUBLICITY.

This company publishes the *Electric City* magazine, largely for free local distribution. The subject of electric vehicles has received valuable consideration in each of its issues. Further the company has used to advantage other mediums in addition to part of its regular newspaper advertising, including such mediums as *ELECTRIC VEHICLES*, the *Power Wagon*, *Garage Efficiency*, etc. Billboard advertising has been frequently used.

Booklets relative to information about the care and operation of batteries, charging apparatus and vehicles have been issued and given wide distribution. In conjunction with this blank record sheets are made up and furnished to enable users to keep a record of the operation of their cars.

A map of Chicago has been prepared showing the location of the various electric garages and emergency charging stations, as well as the principal boulevards and parkways.

Occasionally the merits of the electric vehicle are exploited to the thousands upon Michigan boulevard by the motograph sign located at the north end of Grant Park.

FAVORABLE BATTERY CHARGING RATES.

From this company's experience, it believes the best interests of the electric vehicle can be served by encouraging the building up of large garages which can afford to retain the necessary amount of competent help. Accordingly, an off-peak schedule has been worked out which would apply to installations having a maximum demand of 50 kilowatts or more, and give to the larger garages of 75 to 150 cars, a rate as low as $1\frac{3}{4}$ to 2 cents per kilowatt hour. This has enabled the company to acquire practically all of the vehicle charging business in Chicago, as evidenced by the fact that about 89 per cent of all the charging is taken care of from its circuits.

SERVICES OF SPECIALISTS.

It is convinced that the successful operation of electric vehicles depends more on the daily care received than to any other factor. The company therefore devotes a great deal of attention to the bettering of operating conditions. It has learned from experience to control its enthusiasm when in doubt as to the resultant outcome of individual installations of commer-

cial types to be kept in private garages. It advertises the fact that specialists are at the services of vehicle users and others for advice and consultation, and the public frequently avails itself of this privilege.

CO-OPERATION WITH ELECTRIC GARAGES.

The company's representative visits all the garages as often as possible and keeps in close touch with operators and operating conditions. He advises and co-operates with the garage owners and suggests as to the best methods adaptable to local conditions and equipment.

In the case of private garages, a special man is assigned to handle their calls and see that proper repairs are ordered and made; the minor repairs being made at the company's expense.

EMERGENCY CHARGING STATIONS.

Twenty sub-stations of the company have been equipped with direct current and charging equipment, five being of a capacity up to 200 amperes. The location of these stations was chosen carefully to best serve the general public and cover the city as completely as possible. These charging stations are used considerably by the company's own power wagons, but in a number of instances have been of material service to others, and are thoroughly appreciated by vehicle owners.

CO-OPERATION WITH ALLIED ASSOCIATIONS.

One of its representatives has been maintained as the active secretary of the local societies. It is his duty to take part as far as necessary in all local activities. Other members of this progressive company have been interested in and have occupied important positions in the association's developments since its beginning. The company is now co-operating locally with the Electric Vehicle Association in reference to a downtown electric parking system—a system designed to cope with the present situation which at present permits the user only a very short time to leave his unattended vehicle. Two stations are provided where the owner may leave car and key. Proficient drivers are provided who take the vehicles into Grant Park to be parked until the owner wishes to use the vehicle again.

One of the company's representatives is just taking up the duties as secretary of the Electric Garage and Dealers Association of Chicago. Activities along this line accentuates co-operation with the electric garage as well as the car manufacturer and dealer and binds together allied interest in behalf of the local dealer and garage man.

The present influential condition of this company relative to its position in the electric vehicle industry is the result of "plugging"—constant attention in every channel of development that has any connection whatever with advancing the electric. "Boost the Electric" has ever been its slogan, and it is but natural that with the large expenditures of money which it promotes unselfishly for the benefit of the industry together with its systematic methods of adoption, will without a doubt, assist in keeping Chicago as one of the greatest electric vehicle using centers in the world.

Delivery and distribution by horse is now no longer a business proposition. The light of comparison and analysis, together with the work of auto truck manufacturers in making trucks into business proposition, has rendered horses hopelessly and finally obsolete, at least in the city.

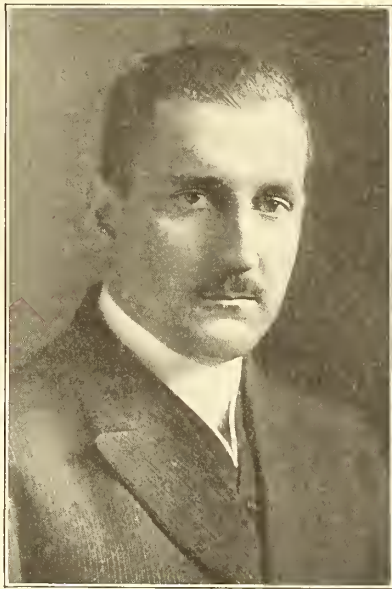
Chicago Dealers and Garages Organize

Chicago Electric Garage and Dealers' Association Offers Many Opportunities

FINAL steps were taken Monday, August 9, at the Metropole Hotel, Chicago, to complete and put into active operation the newly organized Electric Garage and Dealers' Association of Chicago.

This new organization represents the leading manufacturers and dealers of electric cars, the leading electric garages and service stations, battery and tire manufacturers, and the central station interests consolidated into one close co-operative body to further and promote the interests of the electric vehicle in its every branch.

The Chicago territory represents the largest and strongest electric vehicle field in the country. This organization is comprised of the men who have been largely responsible for the great strides made by the electric vehicle and the fact that their experience, brains and money are being consolidated for the good of the industry as a whole marks one of the most important epochs in the history of the electric vehicle business.



Gail Reid, President.

To the thousands of electric vehicle users in Chicago the full importance of this organization can not fail to make its mark. The outline of action covering the first steps to be taken, as read before the association by the president, Gail Reid, are briefly as follows:

The work as a whole will be specialized and definite. The most urgent needs will naturally be given the first consideration—a definite plan of how best to care for these needs will be outlined and remedy put into immediate operation. To raise the entire standard of service, particular lines of work will be placed in the hands of committees, whose members are exceptionally well fitted by long experience to give out the correct solution. One by one these different angles will be worked out with the full co-operation of the entire body, until all the fabric of the business will be raised to the highest possible standard.

The fact that the leading manufacturers of not only the vehicles themselves, but the manufacturers of batteries, tires and accessories will work constantly with the garage and service station to put these plans into real operation, gives the strongest guarantee of their success.

Through the central office will be established a bureau of "up-to-the-minute" information on all matters of value to the business. Through this office

every member of the association will be kept in constant touch with every move of importance, as well as every detail that will prove of value in raising the standard of his service. Every development of value on any member's part will be forwarded to the central office, thus making available a world of good ideas and information for the entire organization.

Careful systems of data and all items pertaining to the business will be compiled. Money-saving systems based on the experience of the business organization responsible for this move will alone permit the giving of much more for the money and service to the owner of electric cars and at the same time show those members availing themselves of this system a decided increase in income. A definite plan was outlined on the question of batteries and tires which will make it easier for the owner of the electric vehicle for the adjustment of any troubles arising from these points. In other words, it will eliminate the too frequent "passing the buck" to the battery man, and he in turn blaming the garage man, and the garage man the manufacturer. Plans will be made to give the co-operation of the central station toward promoting the installation of charging facilities at all outlying golf clubs, country clubs, suburban hotels, etc., that will make possible the greater general use of the electric vehicle.

A standard of service will be established by which garages who are earnestly endeavoring to the betterment of service, will gain the advantages they are entitled to over those who are careless and negligent.

Every means will be used to afford all association garages full information and earnest aid toward bringing their business as a whole up to an association standard. A co-operative plan handled through the central organization toward the purchasing of supplies which will enable considerable saving in all the necessary supplies required for his business. Steps will be taken that will afford garage members of the association the advantage of discounts from dealers and manufacturers who are members of the association on all repair parts and supplies which they will require from time to time for their service on electric vehicles.

Systems will be formed between the association dealers and garage men that will give notice through the central office of all prospective car buyers and prospective garage patrons. This will assure the prospect's learning in full how important it is to his future car service that he avail himself of association service.

All dealers will have complete data and information on hand at all times as to the desirability of all association garages. All association garages will be furnished with up-to-date information on every electric vehicle and its accessories. A program will be instituted to arouse a keener interest on the part of all newspapers, trade journals and periodicals which will give a wide publicity to the work being done. This will improve the care and service of electric cars. The support of powerful advertising mediums has

been assured that will make known in the strongest way how important the association work is to every dealer, garage man and electric car owner.

This association will be a division of the Chicago Garage Owners' Association, which comprises every branch of the motor car industry, and through the central organization every question affecting the interests and welfare of the motor vehicle industry can be fully dealt with and protected.

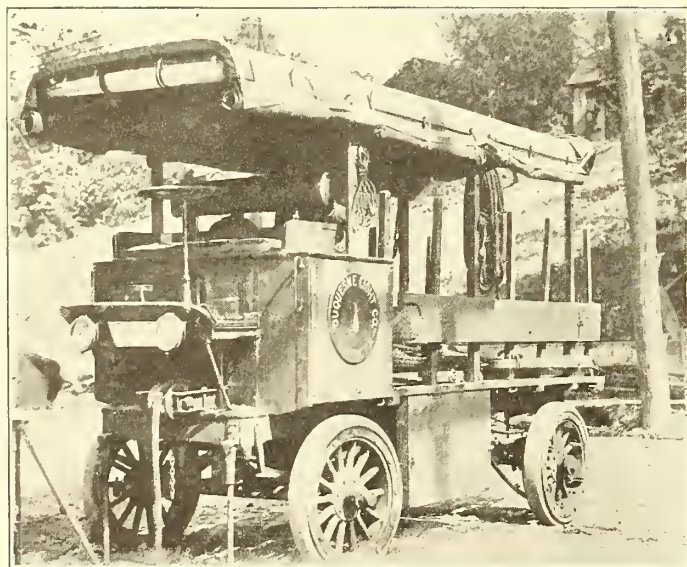
This association will be a genuine, live, up-to-the-minute organization, run on business lines from start to finish, co-operating as a unit to assure vehicle owners of the highest possible service from their cars. It will be made clear to the electric car owner that the surest protection and safeguard to the investment his car represents and the surest protection of square dealing and fair, one price to all—will be this progressive association.

Every garage man catering to electrics should at his very first opportunity investigate what the association can do to build up his business on a sound, legitimate basis.

Electric Truck Operating Costs

The following data regarding the operation of electric delivery wagons was furnished by A. N. Stanton, manager of the Meier & Frank Company delivery and garage department, which operates fifteen electric vehicles in Portland, Ore.:

The three features of an electric vehicle which find favor in the eyes of a driver are steadiness of service,



The Electric Is a Valuable Factor in Central Station Service Departments.

ease of operation, and cleanliness. Furthermore, the electric car holds the record for the greatest work ever done in one day in our delivery service.—namely, 740 packages, covering a distance of 55 miles, all this without an error. Nor would it have made any difference in this day's work had the car been capable of making 30 miles an hour, for there was no opportunity to use such speed, the ability of the car to make a quick stop and start being the prime consideration, and in this the electric car excels.

We often hear the remark, "Surely you must yield the palm to the gas car in hill climbing," but we refer to our records for reply and at least take the edge off

the gas car enthusiast by showing that every day and often three times a day we climb the following gradients:

The consideration of upkeep cost is a very interesting item. For the year 1914 we find that the upkeep cost per mile for gas cars was 3.62 cents; for the electric cars, 2.57 cents, a difference of 1.05 cents in favor of electric cars. Considering this matter per mile does not show in the aggregate very favorably for the electric car, as our gas cars traveled 134,614 miles as against the electric cars 90,180 miles, a difference in favor of the gas cars of 44,334 miles, but when money expended is considered, we find that \$2,551.09 more was expended on a like number of gas cars than was expended on the electric cars. This is equivalent to more than 100 per cent in favor of electric cars in upkeep cost.

Referring to the relative mileage of the gas and electric cars, I will call to your attention that in the matter of package delivery this relation is reversed, for the electric cars during the year 1914 carried 215,000 more packages than the gas cars, the heavier routes being served by the electric cars.

From the data given, we believe we have shown very good reasons for favoring the electric car in delivery work, where conditions are suitable for their operation, such conditions being good roads and reasonable grades, and until some better power is invented than now exists to our knowledge, we shall certainly cling to the electric car in its field as the acme of good service.

On 5 per cent grades our meters showed we were using 65 volts and a 75 ampere draw.

On 9 per cent grades	62 volts and 80 amperes.
On 11 per cent grades	55 volts and 125 amperes.
On 15 per cent grades	43 volts and 132 amperes.
On 16 per cent grades	43 volts and 140 amperes.
On 17 per cent grades	42 volts and 145 amperes.
On 20 per cent grades	42 volts and 170 amperes.

The normal voltage of this motor is 60, and amperage 40 at 1,200 r.p.m. As a companion endeavor, I quote from the report made of a trip from Sacramento to San Leandro, Cal.

Car 1 ton capacity.	Weight of car loaded, 6760 lb.
Motor 60 v., 40 amp., 1200 r.p.m.	Weight of car empty, 4990 lb.
Battery, 65 cells Edison A 6.	Weight of load carried, 1770 lb.

Voltage and amperes draw at various grades was:

1 per cent, 72 v., 47 amp.	15 per cent, 50 v., 260 amp.
5 per cent, 66 v., 100 amp.	18 per cent, 42 v., 280 amp.
13 per cent, 60 v., 250 amp.	

The condition of road from Sacramento to Lodi was soft asphalt; Lodi to Stockton, medium asphalt; Stockton to Livermore, soft asphalt; Altamont Hills, rough dirt; at Dublin, went through field; Dublin Hill, plowed and scraped; Hayward, hard dirt.

Total mileage of trip, 117. Average ampere draw, 4.45. Weather hot. From these reports you will see that neither distance, steep grades nor bad roads affect the electric car, but that it pursues its steady, economical way untiringly.

The purchase of horses was rarely or never a business proposition. Horseflesh is weak and uncertain, and horse-buying (as David Harum knew so well) is proverbially a gamble. The auto truck was also a gamble—but not today.

The possible future economies of efficient motor trucking are incalculably larger than the cost of trucks; \$150,000,000 are spent in New York City alone for trucking goods with horses.

Denver Demonstrates Electric in Mail Service

Operating Data Shows Walker Electric Efficient and Economical in Parcel Post and Mail Collection

AT THIS TIME, when the United States Government is accepting bids for transporting the mails in one hundred-odd cities in the following states—Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, Massachusetts and New York—it will be particularly interesting to note some performances of electric vehicles in this class of service.

One especially interesting test was conducted in person by E. M. Jackson of the Denver Gas & Electric Light Company, with the following results:

ELECTRIC TRUCK DEMONSTRATION FOR PARCEL POST.

April 20, 1915.

One-thousand-pound Walker electric. Ampere hour meter reading, 12 ampere hours. Odometer reading 1434.6.

No. of stops	Place of stops	Time
Start	Central Post Office.....	9:51
1	813 Twentieth street.....	9:56
2	2432 Welton	9:59
3	2741 Stout	10:02
4	3059 Curtis	10:05
5	2500 Curtis	10:12
6	1105 Twenty-first street	10:15
7	2134 Larimer	10:17
8	2701 Larimer	10:21
9	3063 Larimer (P. O.).....	10:25
10	3096 Walnut	10:24
11	3348 Blake	10:26
12	3237 Larimer	10:29
13	1218 East Thirty-first	10:33
14	1500 East Thirty-seventh avenue (P. O.).....	10:36
15	3226 Vine	10:41
16	2830 Josephine	10:45
17	Twenty-eighth and York (P. O. No. 29)	10:46
18	2849 High	10:48
19	2926 Humboldt	10:50
20	2455 Frankline	10:54
21	2316 Franklin	10:55
22	1501 East Twenty-second avenue.....	10:57
23	1424 East Twenty-first	10:59
24	824 East Twenty-second avenue.....	11:02
25	2330 Washington	11:04
26	Five Points P. O. (1,444.6 M.).....	11:06
27	2961 Curtis	11:13
28	2558 Clarkson	11:18
29	822 East Twenty-fifth avenue.....	11:19
30	2330 Washington	11:22
31	St. Luke's Hospital	11:25
32	1948 Washington	11:26
33	930 East Nineteenth avenue.....	11:28
34	1760 Penn	11:31
35	1645 Lincoln	11:33
36	1554 Logan	11:36
37	Colfas and Logan (P. O.).....	11:38
38	1535 Washington	11:41
39	1209 East Colfas	11:43
40	1560 Downing	11:45
41	1567 Downing	11:46
42	1629 Downing	11:48
43	1612½ Humboldt	11:52
44	2010 East Twentieth avenue.....	11:57
45	1500 Detroit	12:03
46	1645 Fillmore	12:06
47	1671 Fillmore	12:07
48	4020 East Eighteenth avenue.....	12:13
49	2052 Birch	12:18
50	City Museum (City Park).....	12:22
51	3416 Colfax B	12:28
52	3425 East Fourteenth avenue.....	12:29
53	Twelfth and Madison (P. O.).....	12:22
54	1200 Vine (1,455.9 M.).....	12:41
55	1144 Race	12:43
56	1057 Race	12:45
57	1450 High	12:48

58	1462 Lafayette	12:50
59	1225 East Twelfth avenue.....	12:53
60	1266 Downing	12:55
61	1154 Corona	12:56
Last leg of eastern route, 1,457.7 M. and 111 A. H.		
62	1126 Emerson	1:01
63	1140 Clarkson	1:03
64	732 East Tenth	1:04
65	1113 Washington	1:06
66	1314 Emerson	1:08
67	615 East Thirteenth avenue.....	1:09
68	1355 Pearl	1:10
69	1376 Pearl	1:12
70	1441 Penn	1:14
71	1471 Logan	1:17
72	1461 Logan	1:18
73	1441 Logan	1:19
74	1480 Grant	1:20
75	1318 Grant	1:22
76	State Capitol	1:24
77	1374 Broadway	1:32
78	1317 Broadway	1:33
79	1203 Broadway	1:34
80	1156 Broadway	1:35
81	1023 Broadway	1:38
82	1045 Lincoln	1:40
83	Eleventh and Broadway (P. O.).....	1:41
84	1227 Acoma	1:45
85	122 West Fourteenth	1:46
86	1338 Bannock	1:47
87	220 West Fourteenth avenue.....	1:50
88	922 Bannock	1:53
89	928 Acoma	1:54
90	801 Broadway	1:56
91	127 East Eighth	1:57
92	758 Sherman	1:58
93	662 Grant (1,462.9 M.).....	2:00
94	941 Grant	2:03
95	951 Logan	2:04
96	800 Logan	2:06
97	930 Penn	2:08
98	933 Penn	2:09
99	Ninth and Corona (P. O.).....	2:14
100	832 Lafayette	2:22
101	1500 East Seventh avenue.....	2:25
102	Sixth and Gilpin (P. O.).....	2:26
103	445 Franklin	2:28
104	525 Marion	2:31
105	Alameda and S. Downing (P. O.).....	2:37
106	124 South Emerson	2:41
107	90 South Washington	2:44
108	367 South Pearl	2:48
109	363 South Grant	2:50
110	76 Lincoln	3:00
111	21 East First	3:01
112	27 Broadway	3:02
113	285 South Broadway	3:05
114	671 South Grant	3:09
115	868 South Logan	3:11
116	700 South Pearl	3:15
117	813 South Washington	3:16
118	886 South Washington	3:17
119	1025 South Ogden	3:21
120	1098 South Washington	3:23
121	1227 South Washington	3:24
122	724 East Florida	3:26
123	Florida and Pearl (P. O.).....	3:28
124	1472 South Pearl	3:29
125	1385 South Lincoln	4:06
126	1400 South Broadway (P. O.).....	4:07
127	Ford Factory	4:11
128	145 West Irving	4:19
129	448 Bannock	4:24
130	315 West Sixth (P. P.).....	4:26
131	1019 West Eleventh	4:31
132	952 Navajo	4:34
133	1175 Owage	4:36
134		

135	754 Jason	4:41
136	1229 Speer boulevard	4:45
137	1305 Elatti	4:47
138	1545 Lincoln	4:52
139	Sixteenth and Broadway (P. O.).....	4:53
140	1540 Cleveland	4:56
141	1515 Tremont	4:59
142	Central Post Office.....	5:03
Odometer, 1,480.9; A. H. Meter, 207.		

TIME OUT.

1154 Corona; shifting the load in the truck—4 minutes.
State Capitol; conversation with party interested in truck—5 minutes.
Ninth and Corona; refreshments—5 minutes.
363 South Grant; shifting the load in the truck—5 minutes.
Half hour for lunch—3:32 to 4:02—30 minutes.
Total Time Out—49 minutes.

RUNNING TIME.

Start	9:51 a. m.
Finish	5:03 p. m.
Gross time	7 hours 12 minutes
Time out	49 minutes

Net time 6 hours 23 minutes

MILEAGE.

Eastern Delivery.		Southern Delivery.	
Start	1,434.6	Start	1,456.7
Finish	1,457.7	Finish	1,480.9
Mileage	23.1	Mileage	23.2
Total mileage, 46.3.			

CURRENT CONSUMPTION.

Eastern Delivery—A. H. required, 99, or 4.24 per mile.	
Southern Delivery—A. H. required 96, or 4.16 A. H. per mile.	
Total ampere hours, 195.	
Capacity of Battery.....	18.14 K.W.H.
Capacity of battery required in demonstration....	10.07 K.W.H.
Charging current necessary to replace 10.07 K.W.H....	14.1 K.W.H.
Cost of 14.1 K.W.H. at 3.6c per K.W.H.....	\$0.5076
Cost per mile for current.....	.01096
Cost per stop.....	.0035
Cost per package .....	.00338

RÉSUMÉ.

One hundred and fifty packages delivered by 143 stops, covering 46.3 miles, in 6 hours and 23 minutes.

The time consumed in delivering to and making the delivery of each stop was 2 minutes and 40.7 seconds.

The average time of delivering to and delivering each package was 2 minutes, 33 1/5 seconds.

The average number of stops per mile was 3.067.

For postal service in the United States it seems that motor vehicles must necessarily supersede the older horse-vehicle equipment, and during the past five or six years a number of motor vehicles have been employed. Conspicuous among these has been the satisfactory performance of twenty to thirty electrics in service in New York City during the four-year contract period closed last year.

Twelve of these electric trucks are now in service, making deliveries from nineteen postal sub-stations in New York to addresses of large and heavy packages sent through the parcel post. This service was begun with the inauguration of the parcel post, seven vehicles having been used during the first months, fifteen for a subsequent period, and later, due to changes in the system, this number has been reduced to the twelve mentioned.

During one winter month in twenty-seven days these machines traveled 7,111 miles and delivered 98,243 parcels. At this rate the parcel post truck fleet covered an average distance of 263 miles per day, or 22 miles per individual vehicle. These vehicles, it should be noted, have, however, capacities of 45 miles per charge. Deliveries were made at the rate of 3,628 parcels per day, or about 303 per day per vehicle. The average distance traveled per package delivered

was 0.0724 miles, or 382 feet. At the rental paid by the government for this delivery service, the average cost per parcel was 3.3 cents, not including, however, the salary of the carrier who accompanied the truck on its round and made the actual deliveries to addresses.

In addition to the electric trucks mentioned, a number of large machines are used for mail haulage between the New York City depots and postal stations. Some of these cars have been in service five or six years, having been used twenty-four hours per day in the year during much of this period. Such mail service, according to those familiar with its requirements, is one of the most exacting to which motor trucks can be applied.

ELECTRIC TRUCK DEMONSTRATION FOR THE MAIL COLLECTION.

April 21, 1915.

Make of Truck, 1,000-pound Walker. Ampere hour meter reading, 2 ampere hours. Odometer reading, 1,489.5.

No. of stops.	Place of Stops	Time P. M.
Start	Central Post Office.....	5:35
1	Equitable Building	5:36
2	First National Bank Building.....	5:38
3	Century Building	5:40
4	Boston Building	5:42
5	Chamber of Commerce.....	5:44
6	Railway Exchange Building.....	5:46
7	Cooper Building	5:49
8	Jacobson Building	5:52
9	Central Building P. O.	5:54
10	Fifteenth and Lawrence.....	5:55
11	Continental Building	5:56
12	Daniels and Fisher.....	5:58
13	Fifteenth and Arapahoe.....	6:01
14	Mining Exchange	6:02
15	Fifteenth and Curtis.....	6:06
16	Gas and Electric Building.....	6:07
17	Denver Post	6:12
19	Sixteenth and Curtis.....	6:17
20	Central Post Office.....	6:21
	Central Post Office wait.....	6:45
21	Nineteenth and Larimer.....	6:48
22	Twentieth and Larimer.....	6:49
23	Twenty-first and Larimer.....	6:50
24	Twenty-second and Larimer.....	6:52
25	Twenty-third and Blake.....	6:54
26	Twenty-third and Larimer.....	6:55
27	Twenty-fourth and Larimer.....	6:56
28	Twenty-sixth and Walnut.....	6:58
29	Twenty-sixth and Lawrence.....	6:59
30	Twenty-seventh and Arapahoe.....	7:01
31	Twenty-seventh and Larimer.....	7:02
32	Twenty-eighth and Lawrence.....	7:03
33	Twenty-ninth and Arapahoe.....	7:05
34	Twenty-ninth and Larimer.....	7:06
35	Thirtieth and Larimer (P. O.).....	7:08
36	Thirty-third and Larimer (P. O.).....	7:11
37	Thirty-fifth and Larimer.....	7:13
38	Thirty-sixth and Walnut.....	7:14
39	Thirty-eighth and Larimer.....	7:16
40	Old Fortieth Street Station.....	7:17
41	Thirty-eighth and Franklin.....	7:20
42	Thirty-seventh and Williams.....	7:22
43	Thirty-seventh and Humboldt.....	7:25
44	A delivery 3643 Franklin.....	7:28
45	Thirty-fifth and Humboldt.....	7:29
46	Thirty-fourth and Franklin.....	7:31
47	Thirty-third and Humboldt.....	7:32
48	Thirty-second and Humboldt.....	7:33
49	Thirty-first and Williams.....	7:35
50	Thirtieth and Franklin.....	7:36
51	Thirtieth and Downing.....	7:38
52	Twenty-ninth and Stout.....	7:40
53	Downing and Champa.....	7:42
54	Twenty-ninth and Champa.....	7:43
55	Twenty-ninth and Stout.....	7:45
56	Twenty-eighth and Glenarm.....	7:48
57	Twenty-eighth and Downing.....	7:50
58	Twenty-eighth and Lafayette.....	7:51
59	Twenty-eighth and Gilpin.....	7:53

60	Twenty-eighth and High.....	7:55
61	Manual Training High School.....	7:57
62	Twenty-fifth and Humboldt.....	7:58
63	Twenty-fourth and Marion.....	8:00
64	Twenty-fourth and Gilpin.....	8:03
65	Twenty-second and Williams.....	8:05
66	Twenty-second and Humboldt.....	8:07
67	Twentieth and Marion.....	8:09
68	Twenty-second and Downing.....	8:10
69	Twenty-third and Ogden.....	8:11
70	Twentieth and Emerson.....	8:13
71	Twentieth and Washington.....	8:15
72	Nineteenth and Pearl.....	8:17
73	St. Luke's Hospital.....	8:18
74	Twenty-second and Court place.....	8:20
75	Twentieth and Logan.....	8:22
76	Twenty-second and Tremont.....	8:23
77	Twenty-second and Welton.....	8:25
78	Twenty-third and Glenarm.....	8:27
79	Twenty-third and Tremont.....	8:28
80	Twenty-second and Washington.....	8:30
81	Twenty-fourth and Washington.....	8:31
82	Twenty-fifth and Clarkson.....	8:32
83	Five Points P. O. Station.....	8:33
84	Twenty-sixth and Welton.....	8:34
85	Twenty-fifth and California.....	8:35
86	Twenty-sixth and Stout.....	8:37
87	Twenty-seventh and Champa.....	8:39
88	Twenty-eighth and Curtis.....	8:40
89	Twenty-sixth and Curtis.....	8:42
90	Twenty-fifth and Champa.....	8:44
91	Twenty-fourth and Curtis.....	8:46
92	Twenty-fourth and Stout.....	8:47
93	Twenty-third and Stout.....	8:48
94	Twenty-third and Champa.....	8:49
95	Twenty-second and Champa.....	8:50
96	Twenty-second and Arapahoe.....	8:52
97	Twenty-first and Champa.....	8:54
98	Twenty-first and California.....	8:56
99	Twentieth and Champa.....	8:57
100	Central Post Office.....	9:00
101	Fifteenth and Market.....	11:02
102	Fifteenth and Blake.....	11:05
103	Fifteenth and Wazee.....	11:06
104	Fifteenth and Wynkoop.....	11:07
105	Fifteenth and Delgany.....	11:09
106	Moffat Depot.....	11:11
107	Fifteenth and Platte.....	11:13
108	Fourteenth and Platte.....	11:14
109	Eighth and Platte.....	11:16
110	Seventh and Water.....	11:18
111	West Twenty-third and Clay.....	11:21
112	West Twenty-third and Boulevard F.....	11:23
113	West Twenty-fifth and Eliot (P. O. No. 3).....	11:26
114	West Twenty-sixth and Boulevard F.....	11:28
115	West Twenty-seventh and Decatur.....	11:30
116	West Twenty-ninth and Decatur.....	11:31
117	Lake Place and Boulevard F.....	11:33
118	West Thirty-third and Boulevard F.....	11:35
119	West Thirty-second and Irving.....	11:37
120	West Thirty-second and Lowell.....	11:41
121	West Thirty-eighth and Lowell.....	11:45
122	West Thirty-eighth and Irving.....	11:47
123	West Thirty-seventh and Eliot.....	11:50
124	West Thirty-eighth and Clay.....	11:52
125	West Forty-first and Tejon.....	11:57
	A. M.	
126	West Thirty-second and Tejon.....	12:02
127	West Thirty-fourth and Wyandot.....	12:04
128	West Thirty-fourth and Alcott.....	12:06
129	West Thirty-second and Bryant.....	12:08
130	West Thirty-second and Dunkeld.....	12:10
131	West Thirty-second and Zuni.....	12:12
132	Dunkeld and Zuni.....	12:15
133	West Thirtieth and Wyandot.....	12:16
134	Sixteenth and Boulder.....	12:18
135	Fifteenth and Boulder.....	12:20
136	Fifteenth and Central.....	12:21
137	Central Post Office.....	12:29

TIME OUT.

Central Post Office—Regular wait—6:21 to 6:45—24 minutes.
 Central Post Office—Regular wait—9:00 to 11:02—2 hours
 and 2 minutes.

Total Time Out—2 hours and 26 minutes.

RUNNING TIME.

Start 5:35 p. m.

Finish 12:29 a. m.
 Gross time 6 hours 54 minutes
 Time out 2 hours 26 minutes

Net time 4 hours 28 minutes

MILEAGE.

Eastern Collection.		Northern Collection.	
Start	1,489.5	Start	1,508.2
Finish	1,505.8	Finish	1,518.4

Mileage 16.3 Mileage 10.2

Total mileage, 26.5.

Eastern Collection—A. H. required, 75, or 4.6 A. H. per mile.

Northern Collection—A. H. required, 48, or 4.07 A. H. per mile.

Total ampere hours, 123.

Capacity of Battery.....18.14 K.W.H.
 Capacity of battery required in demonstration..... 8.85 K.W.H.
 Charging current necessary to replace 8.85 K.W.H.12.39 K.W.H.
 Cost of 12.39 K.W.H. at 3.6c per K.W.H.....\$0.446
 Cost per mile for current......017
 Cost per stop00325
 Cost per collection......003

RÉSUMÉ.

One hundred and forty-seven collections made, with 137 stops, covering 26.5 miles, in 4 hours and 28 minutes.

The time consumed in driving to and making the collection at each stop was 1 minute 57 1/3 seconds.

The average time of driving to and making each collection was 1 minute 49 2/5 seconds.

The average number of stops per mile was 5.17.

PARCEL POST DELIVERY DATA FROM INDIANAPOLIS.

The three Waverley electric delivery wagons used by the Indianapolis post office have proven very reliable and it is declared have never failed to perform any service that they have been called upon to do. In point of speed and mileage they have been found ample for parcel delivery, for the requirements in this direction are well within the range of their capacity. In a seven-hour working day these electric wagons averaged 271.5 parcels in 189 stops over a distance of 18.75 miles. The cost of the day's run, not including the wages of the carrier, was \$5.60. The unit costs were as follows:

Stops per mile.....	6.02
Cost per stop.....	3.25 cents
Cost per parcel.....	2.06 cents
Cost per parcel mile.....	0.0011 cents

Last year the parcel post delivery committee of the Electric Vehicle Association of America, having the co-operation of the N. E. L. A., conducted a very extensive campaign with all the government officials at Washington, the postmasters generally throughout the country, central stations and electric vehicle manufacturers, with the object to induce the post office department authorities to recognize the value which had been credited by the most conservative business organizations throughout the country to the electric vehicle as a transportation utility in city and suburban delivery service.

The comprehensive delivery system of Marshall Field & Co., Chicago, is one of the best examples of the success of the electric in a house-to-house delivery. It should be borne in mind that the parcel post delivery is so similar to any house-to-house delivery, such as department stores use, that their successful operation by such organizations as Marshall Field & Co. should have considerable weight with the post office authorities. There are at present 230 electrics used by Marshall Field, which have an average mileage of 28 to 30 miles per day, some of the lighter vehicles traveling as far as 40 miles per day. To do the same work, from 850 to 900 horses would be required. Gasoline trucks are used for the long hauls.

Chicago Truck Users Protest Against Fenders

Vigorous protest has been made to Chicago city authorities by owners of motor trucks against the enforcement of the ordinance compelling motor trucks to be fitted with fenders. The Chicago Automobile Trade Association, the Chicago Association of Commerce and the Traffic Club joined with private owners in a meeting in the council chamber to enter their objection to the enforcement of this law, which was passed more than a year ago, but which has been permitted to remain dormant until now.

Under the ordinance the clerical, mechanical and inspection bureau of the department of police is charged with the enforcement of the law.

Objection to the use of fenders on motor trucks was based on an investigation made by Russell Huff, president-elect of the Society of Automobile Engineers and a consulting engineer of Detroit. Mr. Huff has, in the course of his study, as stated before the committee, tested hundreds of fenders and investigated scores of other models.

According to Mr. Huff, the motor truck fender has proved an almost unqualified failure. They do not save the lives of the public; they are likely to cause more accidents instead of preventing them; they add to traffic congestion; being imperfect mechanically, they are easily damaged in service and become inoperative within a short time; they are no more needed on motor trucks than on horse-drawn vehicles, automobiles and motorcycles; they cost from \$150 to \$200 each and are a purely experimental burden on the truck owner. Police and coroners' reports from various cities show that only about 10 per cent of the truck accidents consist of victims struck by the front of the truck. The other 90 per cent are caused by people getting under the truck from the side, between the front and rear wheels. This is especially true in cases of accidents to children. Truck fenders, even if perfected to the highest degree, could not prevent these accidents.

Chief Healy, who is the final judge of the fender to be adopted, according to the ordinance, now has under consideration half a dozen auto truck fenders for adoption or rejection.

Among the merchants and business houses which entered protests at the hearing were Marshall Field & Co., Carson, Pirie, Scott & Co., John A. Colby & Sons, William J. Lemp Brewing Company, Albert Dickinson, Reid, Murdoch & Co., Charles A. Stevens & Bro., Mandel Bros., Chicago Telephone Company, Commonwealth Edison Company and Consumers' Company, all of which companies employ many electric trucks.

Chicago Electric Garages Introduce Parking System

A long-desired service for the users of electric vehicles in Chicago has recently been put into effect. It is a system of parking waiting electrics in the shopping district of Chicago and is of an extremely practical and necessary nature, representing a service not extended to any other type of car. As many cities have laws denying the privilege of cars standing unattended for any length of time at the curb, this is often a considerable hardship on the owner.

That an electric obviates the necessity of employing a chauffeur is considered one of its greatest advantages. However, women who run their own electrics have for some time realized how difficult it is to use their cars for shopping purposes in the loop. Appre-

ciating this difficulty, several garages have established under the auspices of the Electric Vehicle Association a downtown parking service for their customers, enabling them to leave their car at the Electric Shop of the Commonwealth Edison Company, where a licensed chauffeur drives it to Grant Park and returns it again whenever ordered. There is no charge for this service. The car owner simply understands that by taking advantages of the service he entirely agrees that the driver is acting only in the capacity of the owner's personal agent or representative while in any way handling the car, and that he assumes all responsibility for its safety.

All electric garages who are represented in the Chicago section of the Electric Vehicle Association are participants in this plan, and shortly a notice will be sent to every user of an electric in Chicago and vicinity, telling about the service. In the fall a night service will be arranged for theater patrons.

The parking system is a much-needed service which, it is hoped, will be extended to other cities where the electricity supply companies will follow the lead of the Commonwealth Edison Company in its very close and practical co-operation.

Large Users of Electrics

Adams Express Co.....	326	electrics	160	gasoline trucks
American Express Co.....	220	"	154	"
Jacob Rupert	145	"	37	"
Geo. Ehret Brewery.....	136	"	..	"
Commonwealth Edison	114	"	2	"
N. Y. Edison.....	130	"	3	"
Gimble Bros.	119	"	97	"
Carson, Pirie, Scott & Co.....	67	"	21	"
Ward Baking Co.....	610	"	42	"

The firm of Chas. A. Stevens & Brothers, Chicago, states: "We were the first company in Chicago to install an electric for delivery purposes. That was in 1897. We find the electric very well adapted to our work. Contrary to usual practice, this company has its electrics in use in suburban delivery, and finds that they are all that can be desired."

Such statements from conservative houses mean a great deal, and this list of installations bears witness further to the possibilities of the economy of the electric when applied to the functions desired in the haulage and delivery. The electric is particularly well suited for house-to-house delivery or other transportation work requiring frequent starting and stopping, due to the extreme simplicity of operation and absence of all gear shifting. Ward Baking Company uses 610 electrics and 42 gasoline trucks.

Goodrich Cuts Capital

Stockholders of the B. F. Goodrich Company, Akron, O., voted at the annual meeting held in New York City to reduce the 7 per cent preferred capital stock from \$30,000,000 to \$28,000,000, which reduces the total capital stock from \$90,000,000 to \$88,000,000. Only 3 per cent of the original \$30,000,000 issue is called for annual retirement, according to the by-laws of the company. While the number of directors was reduced from sixteen to fourteen, the old officials were retained in office, they being: B. G. Work, president; C. B. Raymond, secretary; W. A. Means, treasurer; A. H. Lehman, chief engineer; W. O. Rutherford, sales manager; E. C. Tibbitts, advertising manager; E. C. Shaw, factory superintendent; Charles Wolf, purchasing agent.

ELECTRIC VEHICLES

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This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in ELECTRIC VEHICLES or any voice in its management or policy.

CHICAGO, AUGUST, 1915

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PROGRESSIVE CENTRAL STATIONS

ANY new field in which to sell electrics is invariably judged by the progressiveness of the central station which supplies it with current. There is not a city in the United States wherein great numbers of electrics operate which cannot boast of having a progressive local power company. Without exception the mention of any of our great electric vehicle centers carries with it the thought of earnest effort and large expenditures by the local power company, the institution which really is responsible for the installation of electrics in its territory.

Consequently, to every distributor in any city, large or small, the local power company represents the very first step in the successful sale of electrics. Every dealer, therefore, should insist on material co-operation from his local power company. Any fair minded central station should be easily convinced that it is in truth but a business partner which, during the life of the vehicle, enjoys a much greater profit from battery charging, than either the manufacturer or the dealer can possibly obtain from the original sale.

The very best plan to develop a power company into a progressive central station begins by convincing it first to purchase a vehicle for its own service. In any electric vehicle center the local central station company has a much greater weight in testimony for the electric than any private concern, in many cases unknown, could possibly have. If the power company in your city is not "boosting the electric" at every opportunity dealers should at once be organized into an association and as a body insist that such power companies enter into a co-operative campaign. The home power company, being well known to the average citizen, can at once exploit the advantages of the electric and publish data relative to the operation of its own electrics, showing their reliability and economy. This is of more influence than any advertising or salesmanship which might arise from the local dealers. In every instance insist that the local central station establish an electric vehicle expert at the head of an automobile bureau where the public may secure unbiased facts and data on electric vehicle installation. Furnish this bureau with any reliable operating information which you may have on hand and which may be included in the company's general advertising display. The proof of the revenue to be obtained, if properly placed before the officials of that local operating company, will invariably cause them to become interested in the new business which might be secured from electric vehicles. Plans well made for central station co-operation will eventually cause such a widespread interest in your community that many will investigate and actually purchase, who previously would never have granted an audience to the average electric vehicle salesman.

DEALERS AND GARAGES TOGETHER.

CHICAGO, the greatest electric vehicle using city in the world, receives with much interest the announcement of a new organization to be known as the Electric Dealers and Garage Owners Association of Chicago.

To electric car dealers this association offers the co-operation and protective assistance of every possible branch of the automobile industry. The new organization will make possible co-operation between the manufacturer, the dealer, the user and the garage-

man; all of which means a closer relationship with a more satisfactory service to all.

To the garageman it means an opportunity first to establish a fair garage service policy and then have it recommended by the association to owners of electric.

Further the organization, operating jointly with its allied and more powerful gas car faction, will protect legitimate electric garage interests and soon eliminate those charging stations whose service will not come up to the association's standards of service. In other words, those garages which are members of the new association must live up to the regulations of the body, and in doing so establish themselves favorably with the public.

To the public the association offers its greatest assistance. Where many owners now board their vehicles in garages chosen merely because of convenient location and not by standard of service, the new association will be the medium of establishing for the information of users, those association garages which pledge themselves to fulfil the service conditions required by the organization.

To the industry as a whole it means satisfied manufacturers, dealers, garagemen and users. Standardization of selling policy will permit much more co-operative selling among manufacturers and dealers. Among garagemen an interchange of new ideas and valuable suggestions assisted by the association's influence in obtaining discounts and credits will make it possible to meet keen competition on a fair play and list price basis.

The public most naturally will be protected from any illegitimate methods in any branch of the industry. The association will act as a proper court of appeals insuring fair play and satisfactory service to all, at all times.

WAR ORDERS AND ELECTRIC TRUCKS.

SEE the European orders pour in upon the American manufacturers of motor trucks! The conflict means prosperity for a while, at least, to the truck makers. Gas cars, of course. No electrics used in the war, because it is too far between charging stations. So why should the manufacturers of electric commercial vehicles be interested, even if the gas truck builders are making additions to their plants so that they can double or treble their output? Let the gas people sell the warring nations. There is plenty of business at home for electrics if they go after it hard enough.

But the European war will not last forever. Mighty as are its armies, inexhaustible though its credits may be, implacable as its hatreds are, it will end some day. Then the orders for American gas trucks will cease. Their business will drop back in an hour to the usual, normal result of domestic sales effort. What do you suppose they will do then with their big factories, increased to the maximum solely for war orders? Will they board up the windows and doors of those additions, and let the machinery rust and the mortar fall from between the bricks? Will they rent them out as laundries or carpenter shops? Or will they go on making trucks, using their augmented capacities to force lower prices and more intense sales efforts?

When the war ends there will be thrown into the American commercial scheme a tremendous facility

for the manufacture of gas motor trucks, and an industrial obligation to use that facility. That means a campaign for the sale of commercial vehicles such as the automobile business has never yet seen. It means twice as many vehicle salesmen working on prospects, rock bottom prices, extensive advertising.

What are the manufacturers of electric trucks going to do about it? Nothing? Going to let it go at that, and take a chance on getting the overflow of the gas car business, as usual?

For most purposes electric trucks are better than gas. Their manufacturers know that. But their prospective customers do not know it—yet; and you will never hear a gas car salesman telling them.

In a month, or a year, or two at most, the electric truck manufacturer will be up against the stiffest competition he ever encountered. Of course if he is wise he can prepare to meet it, with the help of the central stations. If he isn't wise it is of no use to talk to him, anyway.

Better gather together, you truck makers, and decide on what course you will pursue when a few thousand gas trucks are thrown on the American market at bargain prices.

GAINING THE SMALL STATIONS' INTEREST.

THE tremendous influence of President John F. Gilchrist's paper, "The Electric Vehicle and the Central Station," which was delivered before the National Electric Light Association's convention at San Francisco is well evidenced by the numerous inquiries received from smaller central stations, which have at last awakened to the electric's possibilities.

ELECTRIC VEHICLES published this interesting paper in the July issue, and many of the smaller power companies have expressed their interest in promoting a campaign, basing their enthusiasm on the advantages of a vehicle charging load as set forth in Mr. Gilchrist's paper.

The contents of this valuable paper, indeed, revealed the most authentic data on electric vehicle operation and its effect on the industry, central stations and the public, that was ever presented.

In spite of the fact that it has convinced many of the smaller central stations that the electric is a current consuming device well deserving of consideration, it left many in doubt as to just what concrete methods to pursue in promoting a successful campaign for the electrics.

ELECTRIC VEHICLES, in order to assist smaller power companies in campaigning the electric, will publish, beginning in the August issue, a series of articles presenting suggestions and methods employed by those successful companies in our larger electric vehicle using centers.

Every possible phase of starting and conducting an electric vehicle campaign will be thoroughly discussed and will explain the final approved methods which have been decided upon after years of careful study and experience secured by large expenditures of money in advertising and literature.

Dealers especially are requested to call the attention of their local power companies to these excellent articles in order that progressive central stations may be developed to "boost the electric," thereby increasing the sale of electric cars and—the important consideration for them—building for themselves a permanent battery charging revenue.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

FOLLOWING is a review of the activities of the Electric Vehicle Association of America since the last report in the July issue, as prepared by A. Jackson Marshall, secretary.

SECTION ACTIVITIES

San Francisco:—San Francisco section held a meeting on July 7 at the Engineers' Club, C. W. Hutton, chairman, presiding. After the reading of the minutes of the last meeting, which were accepted as read, A. Morbio, secretary, read a few paragraphs from the *Guide* on section management.

C. W. Hutton read "Stimulating Electric Vehicle Progress" by James H. McGraw, as presented at the last annual convention.

The executive committee of the section was appointed as follows: E. M. Cutting of the Edison Storage Battery Co., O. A. Schlesinger of the United States Light & Htg. Co., George R. Murphy of the Electric Storage Battery Company, Mr. Gray of the Pacific Gas & Electric Company, Mr. Hardie of the Great Western Power Company, Mr. Sommers of the Westinghouse Elec. & Mfg. Company, Mr. Sievers of the General Electric Company, Mr. Barnes of the General Motors Truck Company, Mr. Wilson of the Guarantee Electric Garage, and Mr. Bright of the B. F. Goodrich Company. It was decided that the section meetings be held on the first Wednesday of each month.

Further that formal meetings be held at night and informal luncheons be held occasionally. It was suggested that at these meetings, members tell something of interest in their particular line, and also suggested that at the luncheons each man wear a tag, giving his name, address and place of business and that all neglecting to do this be fined 10 cents. George Behan suggested that the members mention their personal experiences in the

June 22 at the Hotel Metropole, W. J. McDowell, chairman, presiding.

The meeting was called to order at 1 p. m. John F. Gilchrist, president of the Association, was present and



Society Girls in Chicago Coupe.

gave a short talk. A. Jackson Marshall, secretary, was also present, and gave an interesting account of the electric vehicle industry, setting forth the fact that there is a great future for the electric.

At the executive committee meeting on June 25, at the Marshall Field Annex, Chairman McDowell again presided. The membership committee reported two members.

The traffic regulation committee, D. C. Arlington, chairman, reported that the booklet had been named "Some Traffic Suggestions" and contains some excellent rules of the road.

On June 29, at the Hotel Metropole, the section had a meeting, Chairman McDowell presiding. At this meeting, H. W. Howard of the B. F. Goodrich Company, gave a very interesting talk on tires, confining his remarks exclusively to the truck type. Various methods of testing and comparing tires were described and the good and bad points of each brought out. The speaker demonstrated a scelerscope (an instrument for testing the resiliency of tires, from the rebounding of a weight dropped in a tube), and made several interesting tests on different tire sections, showing the comparative values that would be obtained.

A vote of thanks was tendered Mr. Howard and the meeting adjourned.

Pittsburgh Section:—On June 30, the Pittsburgh section held a meeting at Kleman's Inn, East Liberty, Pa., Chairman W. A. Donkin, presiding.

H. H. Rice, president of the Waverley Company, who was to present a paper, "The Present Opportunity in the Electric Field," was unable to attend the meeting, but sent his paper to L. C. Meyers, the local Waverley agent, to read. Mr. Rice's very practical paper dealt extensively with the great advertising and educational value



G. M. C. Electric Van in Warehouse Service.

way of obstacles encountered in the work of popularizing the electric vehicle. He further suggested that the section meet two nights per month.

Chicago:—The Chicago section held a meeting on

of the electric vehicle in sociability runs, and the wider and more general use of "electrics" by a systematic and continuous campaign for the instruction and enlightenment of the owners. The paper created considerable discussion, which was engaged in by every member present, and on motion of H. A. Campe of the Westinghouse Electric & Manufacturing Company, the secretary was instructed to write Mr. Rice on behalf of the Pittsburgh section, thanking him for this very excellent paper.

It was agreed by the members present, that sociability runs as explained by Mr. Rice would undoubtedly have a beneficial effect in stimulating interest in the electric, and it was decided that runs of this kind would be undertaken by the Pittsburgh dealers in the near future.

William Van C. Brandt, secretary of the Pittsburgh chapter, submitted a letter received from Lieutenant Fitzhugh Green of the United States Navy, who is in the North Polar regions with Crocker Land Expedition, which showed under what trying conditions a storage battery can work and give satisfactory service. This expedition carried with it a battery of 76 cells Ironclad-Exide. It was shipped from the factory in June, 1913, assembled, sealed and charged. It landed in the North Polar regions after a 4,000-mile transportation trip, which included heavy blizzards, ship wreck, rescue and rough handling across ice floes in October, 1913, where it arrived in good condition and all cells active. This letter dated August 1, 1914, and received June 20, 1915, was an enthusiastic "boost" for the Ironclad-Exide battery. Lieutenant reported the efficiency of the battery to be exceptionally high, considering the fact that it was working in zero temperature at practically all times.

This meeting being an annual one, the chairman appointed a nominating committee consisting of T. H. Schoepf of the Westinghouse Company, Harry Silverman, local Baker agent, and L. C. Meyers, local Waverley agent, to nominate officers for the ensuing year. T. H. Schoepf, vice-chairman of the section, made a point of order that it is customary for the vice-chairman to succeed to the chairmanship, but as he was recently elected chairman of the local chapter of the American Institute of Electrical Engineers, he would be unable to accept the office as chairman, and made a motion which was seconded by Mr. Silverman, that the present officers be continued for the ensuing year. The vote was unanimous and the present officers will continue in office.

The secretary reported three new members since the last meeting and it was decided that an active campaign be started to increase the membership of this section. Every member present promised to make it a point to secure at least one new member before the next meeting.

MEMBERSHIP—JULY 28, 1915.

	Active	Associate	Auxiliary	Press	Total	
	C. S. Mfrs.					
June Report.....	106	24	880	12	30	1052
Applications .....	..	..	13	..	..	13
Pending	106	24	893	12	30	1065
Total Members.....	130	..	893	12	30	1065

Under the direction of G. A. Freeman, chairman of the National Membership Committee, the Association is carrying on an extensive membership campaign. With the valued co-operation of the National Electric Light Association, which is at all times immediately forthcoming, and for which the Association is very grateful, there was sent out on July 31, the following letter to about 1,000 member companies of the National Electric Light Asso-

ciation, not members of the Association, in an effort to make these electricity supply companies realize the value of electric vehicle business, and the advantages of becoming active members.

PLEASE BRING TO THE ATTENTION OF AN EXECUTIVE OFFICER.

Gentlemen: At the recent N. E. L. A. convention, the paper "Electric Vehicles and the Central Station" (copy sent upon request), contained an unusual endorsement of some fifty leading central station executives, received a most flattering reception. Prominent officials, in discussing the paper, stated, in substance, that the electric vehicle was the biggest and most profitable single development in the electrical industry, being not only valuable as regards volume—*several hundred million dollars gross revenue in sight*—but in addition was off-peak, long-hour, and low-demand. An ideal condition!

In order to secure this tremendous increase of current output and to promote the electric vehicle industry generally, the electric vehicle association was formed about six years ago and is now carrying forward the work under the supervision of successful central station operators. The association now has 1,100 members, including a large number of central stations who support its practical promotion work in a very substantial manner; also 16 well organized and active sections located in as many cities conducting intensive sales work.

Present dues fall short of the amount being spent by the association. The balance is made up each year by a few. When you realize the association needs your support and further realize that the sale of an electric car in your town is even more important to you than to the car manufacturer, we know you will give us the help we ask. We promise you results.

We make a direct, personal appeal to you!

The enclosed application blank, properly filled out, will materially aid. The *why* is further answered by the condensed prospectus. Detailed information upon request.

Yours for long-hour, low-demand, off-peak business.

A letter was also sent out on July 31st to approximately 1,000 manufacturers of vehicles, batteries and accessories, engineering interests, etc., soliciting their membership and offering our assistance in increasing their sales by the promotion of the use of the electric vehicles and becoming members of our association.

Gentlemen: The enclosed condensed prospectus indicates an important practical promotion work which is being successfully developed by this association. Please read carefully.

All concerns and individuals who in any way profit by the sale and use of electric vehicles are urged to join us in an extensive campaign for greater sales.

Please let us have your assistance now when aid is most needed. Kindly fill out and return the enclosed application blank. We promise you desired results.

Yours for electrical propulsion.

An earnest appeal is made to all members of the association to co-operate with the membership committee in their efforts to materially increase the association's membership prior to the sixth annual convention.

SIXTH ANNUAL CONVENTION.

Cleveland will be the scene of the sixth annual convention of the Electric Vehicle Association, the convention to be held on Monday and Tuesday, October 18 and 19, at the Hotel Statler. There are excellent reasons for believing that this convention will mark an epoch in the electric vehicle industry.

The organization meeting of the convention was held in the office of Samuel Scovil, president of the Cleveland Electric Illuminating Company in Cleveland, on July 19. There were in attendance the following:

Samuel Scovil, president, Cleveland Electric Illuminating Co.; John F. Gilchrist, president Electric Vehicle Association and vice-president Commonwealth Edison Co.; J. W. Fraser, Philadelphia Storage Battery Co.; W. S. Leggett, General Electric Co.; A. F. Davis, Lincoln Electric Co.; M. E. Turner, Cleveland Electric Illuminating Co.; M. R. Berry, Electric Prod-

ucts Co.; T. P. Cagwin, Chamber of Commerce of Cleveland; S. A. Leonard, Leonard-Bundy Electric Co.; George H. Kelly, Baker R. & L. Company; N. H. Boynton, National Lamp Works of General Electric Co.; G. E. Miller, Cleveland Electric Illuminating Co.; T. S. Engelhorn, Chamber of Commerce of Cleveland; M. H. Moffett, National Carbon Co.; R. S. Dunning, Cleveland Electrical League; A. Jackson Marshall, Electric Vehicle Association of America.

After a very extensive discussion it was decided to limit the convention to two days, namely, Monday and Tuesday, October 18 and 19. It is realized that a large number of societies impose heavy demands on concerns and individuals, and that a concentrated program of two days would be greatly appreciated by the large number of delegates who would like to attend the convention. Furthermore, it was decided to make the convention a real business undertaking, so that the many companies would feel justified in despatching a large number of delegates. While entertainment will not be entirely dispensed with, yet it will only be employed to supplement the more serious and practical work of the convention, and it is confidently expected that this policy will find the hearty appreciation of the entire industry, and will go far to make this year's convention a bright spot in the association's history.

On Wednesday, July 21, there was held in the general office of the association a meeting of the convention papers committee, of which George H. Jones of the Commonwealth Edison Company of Chicago is chairman.

As a result of a well-attended meeting, the committee was enabled to draft a tentative papers program which includes treatments of subjects of the utmost importance to the industry. In fact, a number of papers scheduled for presentation unquestionably will be the subject of very wide publicity, as they will have a marked bearing on the new successful year awaiting the electric vehicle industry. Just as soon as the papers tentatively agreed upon are finally approved and acceptances received from those invited to prepare them, they will be announced.

Public Service Commission to Control Jitneys

The New York Public Service Commission has taken the first steps toward the enforcement of the so-called jitney bus law passed at the last session of the legislature, restraining the operating of "jitneys" without the consent of the local authorities or a certificate of public convenience and necessity from the commission. Other proceedings will also be brought within the next few days against other alleged violators of the statute.

This statute, (Chapter 667 of the Laws of 1915), requires all bus lines, motor vehicles, stage routes, any vehicle carrying passengers for 15 cents or less, or any vehicle operating in competition with a common carrier required the consent of the local authorities, to obtain a certificate of public convenience and necessity from the commission before operating in the streets of any of the cities of the state.

Hitherto the commission has considered the enforcement of this law in the hands of the local authorities and has withheld action on its own part until the local authorities had been afforded time to act. Recently, however, a number of complaints have been lodged with the commission against so-called jitney

bus lines apparently operating without authority. At the last session of the commission its counsel was directed to take court action against the alleged violators mentioned above. Complaints also have been received against other alleged violators and these will be handled either in the regular way before the commission, or before the courts.

The statute in specific terms makes all persons and corporations engaging in the "jitney" business, as defined, common carriers and subject to all provisions of law as such.

Electric Storage Battery Company Entertains

On June 26, Herbert Lloyd, president and general manager of the Electric Storage Battery Company, Philadelphia, invited the entire force of the general offices to a lawn party at his residence, "Bòd-Llyd," Bryn Mawr, Pa. This force included officers, department heads, stenographers and clerks—214 in all—who by means of a special train and a number of motor buses at Bryn Mawr station were brought to Mr. Lloyd's suburban home.

The guests upon arrival were welcomed by Mr. and Mrs. Lloyd and treated to a round of games, races and athletic contests which occupied the afternoon. Mr. Lloyd's string of polo ponies played an important part in several of these events. In the early evening a collation was served under the trees, at the conclusion of which the prizes were awarded to the winners of each event. Dancing on the green was in order until train time.

Preserving the Life of Tires

Numerous tests have shown that a tire on a front wheel, which is slightly out of alignment, will wear off much faster than it should. In extreme cases it has been found that running a car for less than a hundred miles, with the front wheels improperly aligned, will completely wear down the tread of the best tire. Besides, such misalignment causes the car to steer hard. The best "tire saver" for the average motorist who drives his own car, is to invest in one of the various devices on the market, insuring absolutely proper alignment, both as to height and to divergence from the parallel lines. The price is ridiculously small when compared to the saving in tire expense.

Menominee Electric at \$1,250

The Menominee Electric Mfg. Company has completed the first of the electric carriages which it intends to manufacture to sell at \$1,250, an unusually low price for an electric. The car has a wheelbase of 108 in., is fitted with Exide batteries and Goodyear cord tires. It can be charged for a distance of 50 to 60 miles and is capable of 18 to 20 miles per hour. The car weighs approximately 1,800 lbs. Doors are wide and the leather top can be let down. The body is painted a royal blue with black hood and back. A charging outfit is furnished with the car by which it is possible to charge the batteries direct from an electric light socket. The company expects to make 150 cars the first year.

It has been carefully figured that 500,000 motor trucks are going to be bought by American business houses in the next ten years.

Hardware Company Trucks by Electrics

In spite of the fact that their electric truck experience dates back to the days of rawhide pinions, motors geared direct to wheels and frequent tow-ins, Messrs. Hammacher and Schlemmer of hardware fame are still enthusiastic users of the storage battery vehicle. Nor is today's enthusiasm apt to be dampened, for the trucks of a decade ago have since been replaced by vehicles of modern design and the delivery system of the company now reaches the entire metropolitan territory with railroad-like regularity.

In the light of present service, the experiences of twelve years ago are decidedly interesting. In those days horses made all deliveries. They went as far as Harlem twice a week and on the day succeeding these trips they rested. Summed up, this means that a team of horses required four days for the Harlem route. This was the limit of the delivery zone. Points beyond were reached by express.

Having in mind this extravagant use of horseflesh, the partners listened with willing ears when a fluent salesman spoke of the merits of electric delivery. They even consented to a demonstration, and were stalled half way to their destination. The small boy's cry, "Get a horse" (this was in '02), was taken literally and the demonstration truck finished its trip behind a team. The art of salesmanship was put to a severe test after this fluke, but finally a second demonstration was arranged. In this case the batteries were fully charged when the trip began and the destination in Harlem was reached without mishap. The return trip was completed in mid-afternoon. Next day the truck covered a route just as long. Sometimes the cut-off worked and sometimes it exercised the prerogative of automatic devices. If the truck quit during the next day's work, a team was hired to haul it in. When repairs were necessary, a machine shop was resorted to and bills for amounts in the neighborhood of thirty dollars were quite the thing.

Thus it happened that in 1903 this firm purchased its first motor truck. It was No. 113, built by the old Vehicle Equipment Company, and provided with motors on each rear wheel while its lead battery was guaranteed to do twenty-five miles a day with a three-ton load. Its purchasers knew little enough about electric truck operation and still less about the care of the machine. This particular car was housed in a stable yard with the other wagons. The charging cable was connected with the battery each night and an automatic cut-off was depended upon to break the current when the battery was charged.

It was a long time before the owners were convinced that these troubles were not all the fault of the truck. Three years passed before another was purchased. Then, seven years later, the original car was traded with the manufacturers for a new vehicle. This truck is the oldest of the present fleet of six cars, two of which were added in 1911, two in 1912, and the last in 1913.

While the operating methods of Hammacher-Schlemmer differ but little from similar delivery installations in this city, the cars have been responsible for various changes in the relation of the company to its customers. When horses were used there were but two deliveries a week to Harlem. Now a three-and-one-half-ton truck covers the territory every day, while a two-ton machine makes two supplementary trips every week, going as far north as Two Hundred and First street. This same vehicle makes Long Island deliveries on two days, while on the remaining two days of each week it makes local trips in Manhattan.

A second three-and-one-half-ton vehicle cares for Brooklyn customers, four trips being made across the bridge each week. The remaining two days are devoted to Jersey trade, deliveries being made in Hoboken, Union Hill, Jersey City, Jersey City Heights and West Hoboken, New Jersey and Long Island as well as all local deliveries are free. Before the trucks were installed all shipments outside Manhattan were by express at the purchasers' expense. Needless to say, this particular change has been responsible for much new business.

The other trucks, one of two-ton capacity, and one of three tons make city deliveries, while a one-ton vehicle serves as a general utility car, its principal work being the delivery of small packages near the store. In addition to these electrics there are still seven horses in the service of the transportation department. These, however, are only used for heavy straight hauls between the railroad and steamship freight stations and the warehouse on Fourth avenue.

As for operating costs and comparative costs between horses and electrics, Messrs. Hammacher, Schlemmer & Co. prefer to let the facts speak for themselves. From one vehicle the installation has grown to a fleet of six and the delivery zone has been extended from a purely local territory to one which embraces practically all the metropolitan district.

As for the difference in dollars and cents inquirers are reminded that all such details enter into the cost of merchandising; the operators of these six cars are well pleased, but the financial measure of that satisfaction is not a matter for general discussion.

Michigan Protects Garagemen

The Michigan garage lien bill, which was fostered by the Detroit Garage and Station Operators' Association has unanimously passed both houses of the Michigan legislature and was signed by the governor. It becomes effective in 90 days. It provides the garagemen with a very effective weapon in that he automatically gets a lien on any vehicle on which work is done until charges for the work are paid. Heretofore garagemen have had to look to the individual for payment.

Goodyear Announces New Stock Distribution

In carrying out the announced policy of distributing common stock to young partners in the company, the Goodyear Tire and Rubber Company has filed papers with the secretary of state increasing its authorized capital from \$8,000,000 to \$25,000,000. Only part of the increased capital will be distributed at this time, the remainder being kept in the treasury for future contingencies.

Detroit License Office Closed

Beginning July the Detroit office of the secretary of state will be closed and all automobile licenses will again be issued and sent from the offices of the secretary in Lansing.

The announcement has caused quite a stir among manufacturers, dealers and owners, as it will cause much delay.

Central electric stations find it most strategic to develop the sale of electricity for electric trucks, because it fills in their night "valley," when comparatively little current is used.

Purchase and Care of the Initial Truck

A Paper Read Before the Ohio Electric Light Association

BY G. DRAKE SMITH



A. G. V. Electric Truck Used in High Tension Line Construction.

WHILE the electric has been on the market for nearly fifteen years, and in common use for several, the average merchant or plant manager is still likely to be influenced by hearsay or personal bias in buying his first truck. A relative or business friend will brag about such and such a truck and Mr. Jones will order one without considering the question of capacity or adaptability. If he does not do this the chances are he will buy a truck made by the manufacturer of his touring car, forgetting that a truck and a touring car are very different. It is very difficult to get the buyer of the initial truck to take his first investment seriously. A small percentage make a very thorough investigation of different makes, but the majority buy on first price, friendship or snap judgment.

I do not hold the truck manufacturer blameless, especially in years past, because if he had had the patience to make sure that the truck sold was specifically adapted to the needs of the buyer, much dissatisfaction would have been avoided and more sales made. The older manufacturers, however, have for some years sacrificed many immediate sales to a policy of adaptability, and this policy is now bearing fruit.

In many respects the man who is now about to buy his first truck has certain advantages over the man who bought his even three years ago. It is no longer necessary to make mistakes in adaptability, especially if one deals with the reputable, experienced manufacturer. Engineering counsel is supplied in modern motor truck selling, not only to aid the buyer but to protect the seller. For the latter to make mistakes is to endanger his future sales, not alone to the buyer in question, but to others influenced by the initial sale.

Ten years ago the electric truck manufacturer was greatly handicapped in adapting his product to the needs of the buyer. For the buyer would consider only horse-wagon standards, and these we know now were lamentably wanting as a foundation for efficiency. The American Express Company, for exam-

ple, first bought three-ton trucks, then one-ton, then two-ton, the proper size for the bulk of their work. The Adams Express Company started in with one-ton in 1903; then one and one-half ton; then reached the two-ton size. Many wholesale grocers began with the five-ton size, only to drop down to the three and two-ton. Nearly every line of business had to experiment, and with no experience to guide him, the electric truck manufacturer could only consent to build what the buyer ordered.

Today the large manufacturer knows from long experience just what to recommend for all the lines of trade which approach standard practice in bulk or dead-weight units. A 1,000-pound General Vehicle department store wagon, for example, has a body whose dimensions are about the same as the old single-horse retailer's wagon, standardized through nearly 70 years' use. It has a speed of 12 miles per hour, and 45 to 50 miles per standard battery charge. The speed conforms to traffic conditions and city ordinances. The mileage is limited not to what the largest battery one can get into the wagon will give; not to what a half-ton wagon at 12 miles can cover in nine or ten hours, but to the average mileage needs of the merchant's delivery service.

Why carry about more battery than you need, cutting down load capacity and unnecessarily shortening tire life? Other G. V. models are equally efficient for business needs. The chassis of the two-ton size is adapted to bodies which are standard in eighteen lines of business. The heavy duty, five-ton size is also well proportioned to the body needs of the coal man, the ice man, the brewer, etc.

But it is in predetermining what capacity of vehicle, what style and size of body, what speed and what size of motor and battery are needed for a given task, and then supplying these, that our company has made its greatest progress in "fool-proof selling."

For example, in Pittsburgh we made little head-

way with the brewers until we practically placed five-ton motor and battery equipment in three-and-one-half-ton trucks and carried out this general idea in other capacities. By way of contrast, we have placed three-and-one-half-ton batteries in five-ton ice trucks where the haul was not over 2,500 feet and the smaller batteries were more than ample for a full day's work. The decrease in battery weight allows loads to be correspondingly increased over normal, without straining the frame of the truck. In other cases we have increased the size of the battery to take care of the extra current needed to operate an electric winch on the truck. We use extra large, powerful motors to overcome sandy conditions in the South, and hills in Australia. Having frame trouble in Los Angeles, we investigated and found that due to the heavy rain-fall the curb stones on the street gutters are from three inches to five inches higher than usual, and iron-bound. This means that a truck going into a garage or stable would have to climb a sudden rise of often



The Reliability of the Electric Makes It Ideal for Emergency Work.

36 inches (or a 33 per cent grade), bringing an extra heavy strain upon the frame. We now reinforce the frames of all vehicles sent to Los Angeles. In San Francisco, to negotiate the hills in good shape, batteries specifically adapted to the capacity of vehicle and the local routes are installed, in one instance a special motor and a battery with 64 cells being used.

Particular attention is now paid to the installation of electric trucks in the smaller towns where people have no knowledge of storage-battery practice and would naturally get into trouble with charging equipment if not properly coached. We also make a special effort to help our customers in cities where there is a heavy snow fall. We have mill trucks in service where the hauls do not exceed 100 yards, and due to speeding up the loading and unloading methods, have made these trucks pay.

In many cases it is not the standard trucks which are at fault, but methods connected with loading and unloading them. I have in mind two trucks in a Maine mill town which gave dissatisfaction, because while they moved coal, sand, bales of cotton and finished goods, they did no more work than the former horse equipment. To load a truck, two men would go inside the mill, get a roll of goods and nonchalantly go back for another. After studying the situation, our engineer suggested that as the rolls of cloth came from the loom, instead of laying them on the floor to be taken out individually, they be dropped into a bin built on a small truck, this to be kept near the loom. Twelve small trucks equipped with ball-bearing castors were built at the mill, of a size to just fit on a one-ton G. V. Boys ran the hand trucks to the door the minute the electric backed up, ran off the empty roll truck and pushed in a full one, the operation consuming about thirty seconds. With one one-ton electric we then did the work which formerly required seven men and four horses, the hauls being about 300 yards.

In another mill this problem of waste time in loading has also been overcome by constructing small floor trucks for work all through the mill. A two-ton electric holds four of these standard units, a three-and-one-half-ton truck, six. The haul of the electrics does not exceed 100 yards and there are sixteen stops in a round trip, yet the electrics pay over horses. The scientific loading methods alone make this possible.

Not only are we overcoming the very-short-haul problems, but we are making rapid progress in solving long-haul difficulties. A large firm in Boston wanted a five-ton electric which would enable it to haul capacity loads to Waltham, 12 miles, and to Quincy, about 9 miles, or 42 miles for the two trips. Our standard five-ton truck normally covers but 35 miles per charge, but by boosting for one hour we were able to give him 44 miles per charge. By means of relay batteries, more particularly a spare battery at the out-of-town end of the trip, we have enabled some customers to secure 70 miles per day with three-and-one-half-ton trucks, while 60 miles per charge with one-half and one-ton wagons, with batteries slightly larger than normal, is very common. Where we have the battery service system all mileage standards go by the board. A one-ton G. V. in Spokane, Wash., recently covered 7,405 miles in four and one-half months, or at the rate of nearly 18,000 miles per year. The cost was 5.05 cents per mile.

About 4 per cent of the nearly 5,000 central stations in the United States operate electric trucks, yet the electric truck manufacturer has received more criticism from this field than from any other.

The transportation needs of the public utility are many and complex. Vehicles purchased for one class of work are frequently used for another. This would cause some dissatisfaction. Then a great many central-station electrics are not standard. The manufacturer following the specifications insisted upon by the central station produces what is asked for, but which is not always satisfactory. Spare parts for special vehicles are of necessity made to order. Should the truck as well as the manufacturer be condemned because there is some delay in supplying these? If your engineering department practically rebuilds an electric to suit your ideas of what it should be, and it does not "make good," is the manufacturer at fault?

I concede our failure to do many things which

might have tended to make our vehicles in some cities do better work, many things which might have given you just what you needed for a specific purpose, but we are correcting these evils as fast as we can. We cannot build a special gas-electric vehicle for one manager, front-wheel drive vehicles for other managers and make any pretense of selling a standard line, to say nothing of selling such vehicles at list prices. Someone has to bear the development expense. I'll guarantee that if we would we could book orders for seventy-five specials from every 100 central stations.

Against the stated imperfections of electric wagons and the faults of a manufacturer such as I represent, must be weighed the numerous examples of neglect, yes, plain every-day abuse, of hundreds of electrics in central-station service. I have in mind a wagon which I sold myself in this state—a one-ton tower wagon. I tried to make it a two-ton tower wagon, but was told the one-ton would be quite sufficient, as it would only carry the tower, a few tools and two men. Today (fifteen months later) that wagon is practically for sale. The engineers complain of poor service and a mileage of 21 per charge. But—that wagon was soon carrying in addition to the tower, a *complete set of line repair and equipment, and from three to five men*. In fourteen months three sets of tires were needed for the rear wheels and two for the front. Our inspector found the weight of the equipment, including driver, to be 8750 pounds. No wonder the body rides on the axle. I could cite many other cases of, shall I call it, *inadaptability*?

On the other hand our company owes a great deal to the central-station engineers who have co-operated with us in developing vehicles necessary for special work or for service under peculiar operating conditions. It also owes a great debt to the central stations who have not only generously adapted the electric for their own work but influenced the purchase of others by the local merchant and manufacturer. We are trying hard to co-operate fully with such companies and we are also trying very hard to properly sell and install the initial truck purchased by the central station just beginning to motorize.

The electric truck is a wonderful vehicle when adapted to the work and properly cared for. In April, 1913, we placed a two-ton, winch-equipped cable truck in the service of the Duquesne Light Company, of Pittsburgh. In 18 months this truck made but 4,175 miles, yet in that time it pulled 200,000 feet of cable at a cost of 1.1 cents, against 2.4 cents for hand-winch pulling. Increased speed and reduction in the number of men required made this possible. In the first seven months of its use this truck saved \$2,700 over the old method, these figures being given over the signature of the general contract agent.

The Duquesne Light Company was good enough to place another one of its two-ton trucks at the disposal of the Pittsburgh Board of Education for a two-day demonstration in competition with a gasoline truck. This truck distributed Christmas trees. The first day it covered 33 miles, using 285 amperes. Loose snow, ice, rough roads and steep hills were encountered.

On the second day all schools in the Alleghany district were covered. "With the driver," states the report, "was the driver of a gasoline truck who stated that some places were reached which could not be reached with a gas truck; mileage 35, amperes con-

sumed 286. No more unfavorable operating conditions could be asked for."

I mention Pittsburgh, because I want to indicate our success under extraordinary conditions, believing that some of you central-station users who are not satisfied with your electrics will be influenced to set your jaws and say, "If they can do it, I can—there must be something wrong with our garage people if they cannot keep an electric going in a level country." I could give you many examples of performance on the Pacific Coast, not from hearsay but as an eyewitness. A little care and common sense will overcome half the central-station trouble with electrics. Even where a one-ton store-room wagon makes but from 12 to 17 miles a day (against its possible 45 or 50), there is no excuse for an operating cost of from 50 to 90 cents a mile, as some central-station figures show. Either the wagon is not adapted to its work and should be placed in another department, or it is simply neglected or abused by overloading or both.

We believe that far greater efficiency may be secured by analyzing a central station's transportation needs and then recommending just the vehicles necessary to best displace existing horse equipment. In past years we have not had the necessary engineering force to spare to do this, but now we are making progress. I have in mind a report now being considered by a central station operating a traction line as well as lighting.

This company operates 14 single and five double wagons, utilizing 28 horses. There are four single service wagons, four single tower wagons for arc lamp work, one painter's wagon, two single street light maintenance wagons, one single cable wagon, one double pole wagon, one double cable truck, one single conduit maintenance wagon and three extra single wagons for special work and reserves.

Our engineer put recorders on several wagons and went out on them. He noted the running time, the stops and waits, the extra delays, as when foreman could not get on the job for one and one-half hours in some cases, thus tying up the work.

He found that an overhead construction wagon carried nine men whose wages totaled \$20 per day. The wagon and two horses represented \$3.09 per day. On this work there was a loss of 45 minutes going to work, one hour waiting on hired team, 25 minutes lost on return trip, or two and one-half hours lost in all. At \$2 per hour for men, this meant \$5 lost on labor alone for this wagon in one day. A hired wagon hauled four tons of cable to the same destination, for which it received \$8. A two-ton electric truck would have saved the two and one-half hours' delay and hauled the cable as well. This gives an idea of electric truck economy in construction work. The superintendent of a New England central station stated that they could haul more cable from the freight house *after supper* than their hired team did all day.

After all estimates based on technical records and eye witness reports were in, it was found that the work of the 28 horses, 14 single and four double wagons could be done with ten 1,000-pound electrics and three two-ton trucks, at a saving of \$13.53 per day in actual operating costs, besides a much greater saving (perhaps \$20 per day) in the time of the men. The electrical equipment, also, would allow the same crews to cover far greater mileages, in fact, provide for a 25 per cent increase in transportation equipment.

Chicago Electric Vehicle Interests Hold Outing

Vehicle and Accessory Manufacturers, Dealers and Garagemen Frolic at Cedar Lake

ELECTRIC vehicle interests in Chicago consisting of the Chicago section, Electric Vehicle Association, Chicago Garage Owners' Association, Chicago Motor Livery Association and Illinois Tire and Accessories Dealers' Association, held their annual outing and picnic at Cedar Lake, Ind., July 29.

Nearly 250 guests formed at the Fashion garage and were conveyed in gas cars to the lake and arrived at noonday.

The very first event scheduled was a splendid chicken dinner at McLoughlin's Lakeside Inn. After luncheon the entire party was entertained with a launch ride, encircling the lake.

At 2:30 p. m. a grand prize drawing was held. The drawing was a special feature and open to all those who had purchased tickets. Thirty-two excellent prizes were granted the winners. The prizes were as follows:

1. Choice Cedar Lake lot, Joint Associations.

2. 6-80 starting and lighting battery, Edison Storage Battery Company.

3. Set Johnson shock absorbers, Triple Action Spring Company.

4. 6-80 sparking and lighting battery, Volkcar Storage Battery Company.

5. 8-day keyless auto clock, Phinney - Walker Keyless Clock Company.

6. 34x4 non-skid casing, Firestone Tire & Rubber Company.

7. 1 pair 10-inch Auto headlights, Vest Accumulator Company.

8. Auto trunk with suitcases, Beckley-Ralston Company.

9. Set Messa shock absorbers, Times Square Auto Company.

10. Model 30 Warner speedometer, Stewart-Warner Speedometer Corporation.

11. Brooks tool kit, The Auto Supply Company.

12. 8-day auto clock, Chicago Auto Supply House.

13. 6-60 UnXLD battery, Motor Car Supply Company.

14. Ten gallons Monogram oil, Monogram Oil Company.

15. 36x5 Gray tube, Swinehart Tire & Rubber Company.

16. Spartan motor-driven horn, Matador Tire & Valve Company.

17. Man's slip-on coat, Fred Allen Auto Supply Company.

18. Portable pocket testing instrument, Jewell Electrical Instrument Company.

19. Quart-size carafe bottle, Electric Appliance Company.

20. Motor luncheon case and table, Knickerbocker Case Company.

21. Ten-dollar gold piece, F. E. Sparks.

22. Electric flat iron, Commonwealth Edison Company.

23. Electric toaster, Commonwealth Edison Company.

24. Electric percolator, Commonwealth Edison Company.

25. 34x4 plain casing, Goodyear Tire & Rubber Company.

26. Electric utility grill, General Electric Company (Fort Wayne department).

27. Hand Klaxon horn, Excelsior General Supplies Company.

28. Case Uno Speedway Polish, Uno Manufacturing Company.

29. Half barrel Golden auto oil, Star Oil Company.

30. *34x4 non-skid casing, Empire Tire & Rubber Company.

31. 6-80 lightning battery, Gould Storage Battery Company.

32. 6-80 lightning battery, Willard Storage Battery Company.

Following the prize drawing, the famous annual ball game was staged. Many of the celebrities in the various industries represented "strained a muscle" in an effort to score the winning run. McCall's "Colts" were victorious over Salvat's "Indianans"



Walker Vehicle Company Officers Arriving at Cedar Lake.

after a hard-fought and exciting game.

Special prizes were donated to the Chicago Electric Car Company for having the only electric which made the return trip in an electric.

The evening was devoted to dancing and cabaret and the entire affair was acclaimed a splendid event by all.

The horse is such a common sight everywhere that we do not realize the terrible waste he is. Over \$130,000,000 in horseflesh dies yearly; for the average life of the work-horse, except on the farm, is but six years. There are millions of horses in commercial service, and the lot of the city work-horse is not a merciful one. Again, the auto truck means more sanitary streets, less traffic congestion, lower city taxes.

The electric principle in motor trucking is, however, widely admitted to be the most universally applicable, since 80 per cent of all average city deliveries come within the field of the electric.

What Can Be Done to Improve Conditions?

A Paper Read Before the Detroit Motor Truck Convention

WE ARE living in a rapid and revolutionary age. Time-

honored traditions have been swept away and new practices have taken their places to an extent not fully appreciated, even by those who have been most deeply concerned in them.

We have been in the past a careless, prodigal and unscientific people in our methods of manufacture and marketing our products. However, no one alert to the situation can have failed, in recent years, to notice the many able and instructive articles appearing in magazines and trade journals treating the problems of proper management of business, not only in producing goods, but in advertising and selling them.

While this process of business instruction has been going on, there has also been a very noticeable renewal of activity in discussions among business men, privately and in conventions, assemblies and conferences of those engaged in similar lines and having similar problems to meet.

A few years ago a competitor was an impossible person who must be held at arm's length, while today these conferences have more of the appearance of a gathering of business associates for the discussion of vital problems affecting the industry.

Recently invitations were extended for a conference of motor truck manufacturers, dealers and those engaged in kindred lines, and in the month of October in response to that invitation some 300 representatives met and discussed matters of interest to the entire industry.

That the men engaged in this industry felt the need of such a conference is evidenced by the number who attended; and the character of the problems needing careful consideration is shown by the questions considered:

Here are some of the topics discussed at that conference:

1. Time payments plans for motor trucks.
2. Territorial lines for dealers.
3. Evils of overloading and overrating trucks and permissible body weights.
4. Demonstrations—necessity and charges.
5. Reforms needed in merchandising motor trucks.
6. Manufacturer's guarantee and service to owners.

As a result of this conference, an immediate need of an endeavor to co-ordinate in some way the great number of manufacturers engaged in the motor truck industry became apparent to those who had participated in it. The problem then became as to whether this co-ordination and co-operation should take place by joining, (1) an existing organization covering both pleasure and commercial vehicles, or (2) an existing organization embracing motor truck manufacturers, dealers, users and the like, or (3) forming a new organization; or, (4) holding stated conferences from time to time to which all truck manufacturers should be invited, without a general organization. This problem is not settled.

We boast that the United States is a free country, and that opportunities are alike for all, but I sometimes think that we pay tremendous penalties for this freedom, particularly the freedom with which, without adequate capital, without experience, and without

credit strength, any man or group of men may engage in a business

requiring large capital, large experience and credit strength, and do tremendous damage while they exist without gaining any advantage for themselves or their stockholders or the purchasers of their products, and certainly not for their creditors who are left to mourn over the inadequate remains.

There are serious difficulties to be encountered in connection with each suggestion, but the fact remains, in my opinion, that no plan can be successful except one which permits all engaged in the business to come in and participate, in order that those who most need to be taught the lesson of trade abuses, and who most need the steady hand of their stronger brothers, may not stumble by the wayside, to the great detriment of the industry as a whole.

I have implied that trade abuses exist—it is a matter of common knowledge to you—and the suggestion has been made that the fatal results which follow the practice of them should be continually emphasized by a process of instruction carried on through the medium of one of the four ways indicated in this paper.

Having thus publicly stated to you these things, it would perhaps be unreasonable and savor of lack of courage or insincerity unless at the same time a frank statement is given of the things which, in our opinion, constitute trade abuses that should be remedied.

There have been certain strong companies doing a national and sometimes an international business, who have, with their wide facilities and tremendous organization, found it advisable, and doubtless profitable, to sell their product in partial payments extending to sixteen months, and sometimes more. These companies are credited with a large working capital and with a sufficiently extensive and competent organization to handle the tremendous detail involved in:

First, passing upon the credit of the purchaser.

Second, approving, as to substance and legality, the chattel mortgages, conditional sale contracts or leases, applicable in the different states of the union.

Third, securing adequate fire and liability insurance.

Fourth, keeping track of dates of maturity, renewals, interest, etc., etc.

Fifth, time and method and expense incidental to the enforcement of the manufacturer's claim against delinquent debtors.

These matters of detail are expensive and accompanied by many risks and some losses, and compensation therefor must come either from the increased selling price of the product or a lessening of the cost of manufacture by reason of the volume of the business done.

There are a great many concerns engaged either in the complete manufacture or assembling of commercial motor cars, and very few of this number have the necessary working capital, the organization, or the volume to sell their product on a partial payment basis. Some of them, however, either from the habit of imitation, miscalculation, inexperienced judgment, poor judgment, or ignorance, are endeavoring to meet the competition of large companies by giving equal terms in partial payments, with the result in some

cases of the gradual extinction of cash capital and of increased debts, largely contingent, but nevertheless a real menace.

In a certain other well-known line of business not connected with the automobile industry, this depletion of cash capital by these practices was met a few years ago by the sale of accounts, accompanied by warranty and ruinous discounts, and this condition became so general that in the year 1914 no line of manufacture showed so many failures, and for large amounts.

It is significant to us in the truck business, or should be, that the concerns in the line of industry mentioned who failed, and failed ignominiously, were those engaged in selling their product in partial long-time payments.

There is room enough in this country for the large and the small manufacturer, each filling its particular field, and all of the methods of the large cannot be followed with safety by the smaller companies. I have no doubt that many of the larger companies, selling by installments, could well profit by the excellent business judgment of the smaller ones in selling for cash, and perhaps in other ways. If we are to draw any lessons from experience in other vocations, we will find no comfort in the sale of an expensive and movable product by long-term payments.

One of the decidedly helpful ways in which men engaged in the same line of industry may assist one another and prevent imposition, is by a frank request for information and frank reply as to qualifications, salary and the like, when an application is made for employment by a man looking for a substantial position.

For some reason, perhaps natural on account of its sudden rise, our line of industry seems to have attracted to it many adventurers with no lasting qualities, but exceedingly glib in setting forth the great results obtained in their work for other companies. Our unfortunate experiences in accepting these representations at par undoubtedly have taught us by this time to discount them heavily, but nevertheless many manufacturers would undoubtedly save much money and avoid many unpleasant experiences should such an exchange be universally adopted.

There has become prevalent among business men, many of whom are prospective purchasers of motor trucks, a decided distaste to a conference with a salesman in which a major part of the time is consumed in condemning the product of a competitor, a practice commonly known as "knocking." Not only does this practice result in harm to the men engaged in it, as well as to their company, but also to all manufacturers of trucks, for things of this nature have a strong tendency to belittle the industry and create the impression that the men engaged in it as a whole are not modern and instead of creating a general sentiment that all makes of trucks have their good qualities, the opposite idea is driven into their minds.

For the sake of the good name of the business, therefore, dignity in merchandising should be continually spread broadcast by those who ought to sustain it on the lines of good business policy as well as of principle.

Many of the younger companies are managed by men not thoroughly conversant with the motor truck business, and who, lacking wide general experience in other lines of industries, fail to appreciate that the margin of profit in this industry is comparatively small

and also fail to appreciate how much of a factor of safety should be provided, above actual cost of manufacture, selling and administration, to provide for the contingent obligations which many of them assume.

There is a limit beyond which no manufacturer should go in the matter of guarantee, who is selling a product such as trucks, where improper operation could very easily result either in a serious controversy with the customer or the payment by a manufacturer of heavy sums under too broad or too long a guarantee. Experienced men are able to advise us as to the length of time which ordinary conditions would require to develop improper material used in manufacture. What this limit is can best be determined by the technical man in the business. To me it has always seemed that three months would be ample. If a longer time is given, almost invariably it seems that the manufacturer is compelled to make good to save the good will of the customer, whether it is the fault of the product or not.

There is another class of manufacturers who, believing that service is the best kind of advertising—and no one disputes this—have been led into extravagant expenses. Once this practice is established by a company, the small items begin to run into large figures, and this, with other things, reduces the factor of safety and the possibility of profit.

There is another practice more or less prevalent, and perhaps the most difficult of any to control, and that is selling at less than list prices, either by special discounts, ridiculous allowances for old trucks, or the giving of agent's discounts where no bona fide agency exists or is intended to be created. This practice may and does in some cases result in sales, but in nearly all such cases both the customer and the manufacturer are in danger of losing their self-respect—one because of his taking something which does not belong to him and to which he is not entitled, and the other by giving away something that belongs to the stockholders of his company.

I do not mean to say that special circumstances do not exist whereby old-time customers are not entitled to special consideration. I am only endeavoring to emphasize the dangers attending such practices.

I am convinced that it is the business principles of the industry that need attention at the present time, and that many things might be done to improve them, such as co-operation among manufacturers; elimination of long-time payments, long, extravagant guarantees; knocking among salesmen; price cutting; too liberal service policy.

We need to conserve our resources. We need to secure greater confidence by bankers in the motor truck business. We need to educate the general public to the advantages in the use of commercial cars. We need to scrutinize legislation inimical to the user of such cars as well as to the manufacturer. We need combined action to curb high financing in order to obtain and preserve the confidence of those who invest in our stocks and securities, or loan us money or give us credit. We need to inculcate in the minds of everyone connected with the industry that the same business principles which prevail in other lines must prevail in this one, if the business is to endure. We need an organization that will teach these things, and promote them, and we need to know each other better, that we may acquire a broader knowledge and broader experience in the things which pertain to motor truck manufacturing and merchandising.

What Constitutes Service to the Owner?

Application of Common Sense to the Defective Parts Clause of Guarantee—Reasonable Free Adjustments

THIS question implies existence of a definite and fixed policy that does not exist. In fact, we may say that "service" means something different to every manufacturer. We will therefore take the liberty of changing this query to read: "What should constitute service to the owner?"

Service to the owner should embrace the following main items:

1. Parts.
2. Repairs.
3. Supervised instruction.

Besides co-operation between manufacturer, dealer and owner is a necessary adjunct. Each has a very distinct duty, the performance of which alone makes successful service possible, and after endeavoring to define what we mean by "parts," "repairs" and "supervised instruction," we will state what we think these duties should be and the manner of their performance.

By "parts" we mean not only the matter of purchasing new parts to replace those actually worn out and the method of replacing defective parts, but also the rules which determine whether or not a part is defective, and for such as are found to be defective the proper passing of credit.

There should be a sufficient supply of parts so located as to be at all times conveniently obtainable by the owner. There should be a well-defined meaning of the word "defective"; this definition to be the result of judgment, which, though broad and liberal-minded, will impartially consider the manufacturer as well as the owner. This determination must of necessity permit the use of common sense in the judgment of particular instances, but each particular instance should be carefully recorded as such and care taken to guard against their injudicious increase.

Accidents, lack of oil or grease, unskilled driving and temperamental differences between owner and dealer are some of the things which service should not be called upon to make good.

In this very connection, were the question asked, "Has the manufacturer been too liberal in his interpretation of the word 'defective' as applied to his dealings with dealer and owner?" would not the implied information be forthcoming? Has the time come to strictly enforce the 90 day warranty or at least to so supplement it that the limit of broad interpretation may be definitely fixed? "Free from defects in material or workmanship under normal use and service" seems to be a very definite phrase, but is the meaning of "normal" accurately understood.

When these questions have been squarely met and answered and a standard set up, the owner should unquestionably be entitled to replacement of all parts free of charge which are defective in material or workmanship, and for these reasons only, and during 90 days only, or whatever the specified time may be. Making these replacements, or passing credit for a like amount, should be made contingent, however, upon the receipt of the defective parts, transportation charges prepaid.

BY CHARLES GOULD*

By "repairs" we mean those facilities for the repair of parts, the adjustments and inspection, the establishment of a definite rule in regard to the amount of free adjustment and inspection, and the fixing of a scale of prices for certain classes of work. Service to the owner should constitute these facilities and the rules governing their use. Not only should the owner be entitled to know beforehand the cost of work when the amount of it can be predetermined, but he should be given to understand in no indefinite terms the exact amount of free adjustment and minor repairs he can expect. To make this effective, there must be a well-equipped and well-run shop. A careful and painstaking policy, leavened well with courtesy and a spirit of "nothing is too much trouble," should be observed in the conduct of this shop.

Instruction constitutes a very important part of service to the owner. It should begin with the sale of the car, in supplying him with complete information in printed form regarding not only the care and maintenance of his car, the proper method of ordering and returning parts, but also suggestions relative to all other matters which will lead to the fuller enjoyment of his car and to the keeping down of his cost of maintenance.

These instructions should be constantly called to the owner's attention by showing him, if possible, the violation of what particular rule has made repairs necessary. At every opportunity he should be impressed with the fact that his car is a very valuable piece of machinery and that it requires a fair amount of care and attention. He should be shown that neglect is not only a poor substitute for this care, but made to see to what extent it has touched his pocket-book. So instruct him that he will share with you the knowledge that although his car will perform wonderful feats, it is not equipped with a brain, and by these instructions convince him that an ounce of prevention is worth more than a pound of cure.

It should be the duty of the dealer constantly to maintain a complete supply of parts. He should be guided absolutely by the company's policy in making adjustments and replacements, and he should not only pass to the owner the same amount of credit he receives from the company, but go even further in his interpretation of the meaning of the word "defective" and be more liberal in his allowance of free adjustment and minor repairs.

It should also be the dealer's duty to maintain a proper repair shop. He should make it his particular duty to insist upon a systematic inspection of the owner's car and it should be his earnest endeavor to instruct the owner in the proper manner of adjustment and minor repairs. While the latter may tend to curtail somewhat the volume of his repair business, it will be more than made up to him in increased sales and he will be rewarded also by a constantly growing number of satisfied customers. To properly enforce the policy laid down by the manufacturer, particularly where it is his clear duty to refuse free material or labor, he should keep a separate record of every car and the amount of service performed on it.

*Read before the N. A. C. C. Service Managers' Convention.

The manufacturer's duty should consist in establishing the rules governing service to the owner. It should also be his duty to see that these rules are rightly enforced. He should conduct a systematic inspection of the dealer's stock of parts, his shop practice, accounting methods and the charges made for repair work. He should instruct the dealer in the best method of keeping such records, the inspection of which will reveal to him exactly the amount and kind of service the dealer is giving, and when this inspection reveals the need of a change, the manufacturer should insist upon it being made.

Before passing credit to the dealer, he should insist upon the receipt of the owner's name and address, and when such credit is passed to the dealer, the owner should at once be notified. Pride alone should teach the manufacturer the necessity of jealously guarding the method of his dealers in handling his product.

He should also do his part in keeping dealer and owner thoroughly posted at all times in regard to the results of his experience, and in order that this experience may consist of more than the information gathered by his representatives in the field, he should maintain a well-equipped service experimental laboratory for the purpose of adding to the general sum of mechanical knowledge, with particular reference to adjustments and repairs. The benefits of such work should be passed along by him to both owner and dealer. Any suggestions received from the owner or dealer should have his immediate attention, whatever their value. Full credit for such as may lead to an improvement, and the reason for the impracticability of the rest, should be courteously given.

The manufacturer should constitute himself the umpire of all disputes between owner and dealer and his decision should be absolutely final, and, although the owner should be made to feel confident that he will be accorded at all times just and fair treatment, he should be held strictly to account for any attempt at sharp practice. The policy of standing back of one's representatives will work out as successfully in the giving of service as elsewhere.

It should be the owner's duty to assist in every way towards properly and efficiently carrying out the service policies as outlined by the manufacturer. He should furnish all information necessary to the proper filling of orders and the issuing of credits. At the very outset he should be made to understand that it is not the dealer's nor the manufacturer's duty to write him for information which should have been part of his original order. He should not be coaxed too often to use the same kind of business methods when ordering or returning parts as are necessary in probably all of his other business dealings. As the matter of service concerns him chiefly, he should be more than willing to co-operate, not only by calling the manufacturer's attention to shortcomings on its own or the dealer's part, but he should be ever willing and ready to make helpful suggestions to the manufacturer and dealer, which in the final analysis will rebound to his own interest.

Finally, a service to the owner which is actually furnished by the dealer under a systematic and well-defined policy laid down and supervised by the manufacturer not only can be made the means of an enormous financial saving to all concerned, but also will create a well-founded feeling of satisfaction which the

combined co-operation of dealer, manufacturer and owner will do much to foster.

Detroit Electric Shows Low Cost of Operation

The Anderson Electric Car Company announces some interesting data compiled at the factory concerning the twenty-six-day run conducted in June with a Detroit electric stock brougham. It is shown that a total distance of 2,065 miles was covered by the electric at a total expense of \$29, the cost per mile being \$0.0141.

The car used for the test was a model 53, weighing 3,962 pounds, having a 42-cell 15 W-T-X lead battery and being fitted with Goodrich Silvertown cord tires, 34 by 4½.

The average number of passengers carried on each run was five, the minimum was four and the maximum was six, five being carried on eighteen of the twenty-six runs.

An average speed of eighteen miles per hour was maintained during twenty runs, the maximum speed was twenty-two miles per hour and the minimum speed was seventeen miles per hour. The longest run was 100 miles, the shortest was sixty two miles.

The cost of \$29 for the twenty-six days during which the test lasted included a charge of \$26.56 for current, \$1.56 for flushing the batteries eight times, 75 cents for filling spring grease cups three times and 19 cents for tightening the steering tie rod one time. There were no expenses for either battery, tire or mechanical repairs. When the test was announced it was to extend only over a period of twenty days, but owing to the interest shown, the runs were continued to the end of June.

First Electric in Edinburgh Scotland

Electrics have never been in use in Edinburgh for pleasure or business.

It is noteworthy that the Edinburgh corporation is the first purchaser of an electric vehicle in that district, and still more noteworthy that it is the intention of the committee in charge of the municipal electricity plant to encourage the introduction of electric trucks, vans, and other cars. The committee has acquired, through a London agency, an American-built electric truck having a carrying capacity of 1½ tons and a guaranteed speed of 11 miles per hour on the level and 5 miles per hour on a gradient of 1 in 10 with full load. The accumulators are of the Edison type. With a full charge the truck is capable of traveling 40 miles with a load of 1½ tons and 50 miles with a half load. The control is effected by one handle fixed to the steering wheel, which alters the speed of the motor, so that there are only the controller handle and the brakes to manipulate.

The electricity required for one full charge is about 35 units. With electricity at 2 cents per unit, the cost per mile will be slightly less than 1¾ cents on moderately level roads with good surface. The cost of the vehicle complete is \$3,382.21.

The committee has undertaken to supply electricity for the charging of such vehicles at the rate of 2 cents per unit and has made arrangements not only for charging but also for storing vehicles in the municipal electric stations. It is considered not unlikely that the result will be a fair demand for commercial electric vehicles and also electric cars for pleasure and professional purposes.

Construction of Cord Tires

Origin, Development and a General Discussion on Its Factors of Substantiability

By JOHN F. PALMER*

CORD tires are uppermost in the minds of thousands of motorists who have learned of the phenomenal performance of these tires.

The name cord tire originated in England, about the year 1900, when the conventional type of cord tire was first used on automobiles to distinguish it from a lighter cord tire used on bicycles for seven or eight years previous. The original bicycle tire was known as the Palmer and the tire for automobiles known as the Palmer cord. The Silvertown cord tires, used on all the cars finishing at Indianapolis, is the English Palmer cord, made under license in this country by the Goodrich Company.

While the present cord tire has shown its right to consideration, the writer believes that the final chapter in its development has not yet been written, and that much can be done in the way of improving the cord as well as in reducing the air pressure permissible.

In 1848 an Englishman named Thompson conceived the idea of binding a column of air on the rims of vehicle wheels as a cushion or insulation against the shocks due to road inequalities. Such was, and is the fundamental idea of a pneumatic tire. Its practical application has engaged the attention of a long line of inventors, as contributors to the better expression of the Thompson idea as applied to vehicles carrying their own power.

The idea of an air tire is old, yet it was 40 years or more, in the early '90's, before it was made of practical value, when J. W. Dunlop, a Dublin veterinary surgeon, applied it to the wheels of a bicycle, and the air tire came into its own, making possible comfortable road travel at high speed as compared with the then existing means and as well methods of construction of vehicles, bicycles and automobiles.

None has ever found a better cushion than air; it has no fatigue point, it stores and returns the energy used in compressing it as opportunity offers and is always on duty, provided the conditions of such service are present, viz.: 1—An envelope impermeable to air under pressure that will bend out of its normal circular shape without friction or resistance other than that of the air it contains. 2—In addition to fulfill other and heavier duties, some contradictory in their nature.

Fine para rubber properly treated and vulcanized best meets the first condition. The second is the real problem; of what material and how to make that portion of the envelope that cares for all the strains incident to the air pressure in the tire and the weight of the vehicle and its load; the push of the motor in driving; the reverse strain of stopping by brake; the transverse strains of control by steering wheel; the blows of road inequalities against the air; and lastly, ignorance of its limitations, structure and care by the user.

Having in mind that most desirable characteristics in a tire envelope "that will bend or suffer distortion

of its normal circular shape without friction or resistance other than the contained air pressure," let us see how the square-woven fabric or canvas tire meets it:

First: There must be sufficient strength in the tire wall to sustain an air-pressure up to 120 pounds per square inch; multiply the pressure you carry by one-half the internal area of your tire in square inches and you get the measure of a constant duty of surprising proportions. Suppose your tire measures 100 inches in length with an internal area of 10 inches = $\frac{1}{2}$ of 10 and $5 \times 100 \times 50$. This gives a total pressure of 25,000 pounds, this is approximating the total constant pressure on a 32 x 4-inch tire at 50 pounds per square inch, add to this a factor of safety made necessary by the blows and shocks incident to use, and it will be plain that only by using a number of piles of such fabric can this duty be met.

It might be well to state that square-woven means threads of equal strength and number per inch in both warp and filler of the fabric used in the tire.

These several plies of thicknesses must be stuck or vulcanized together that they may operate as a unit. Each ply added increases the resistance to that action quoted above; and it is also found that inasmuch as the warp and filler of square woven fabric are normally disposed at right angles to each other, it is impossible to manufacture a tire of this fabric, even when it is cut on the bias and stretched over tire forms by machinery with even approximately a uniform angular placing of the threads without which a tire product with uniform performance cannot be secured. Warp is the technical name of threads running together lengthwise of a fabric and filler on warp designates the cross threads.

Second: By reason of the warp and filler threads being interwoven, and operating under high tension, there is further resistance to bending or distortion, with the added disadvantage that such bending sets up movement in the interwoven warp and filler of the square fabric with resulting heat and wear.

Third: As such fabric cannot be woven of sufficient width for a section cut on the bias to furnish enough length of material for one complete circuit of the tire, there is of necessity two or more joints in each ply, and wherever such a joint is made the resistance to bending is doubled, the difficulty of uniform angular placing of thread made insurmountable and the balance of strain resistance in warp and filler dislocated; when this is multiplied by the number of plies made necessary by strength requirements, the wonder is that canvas tires perform as well as they do. Added to this the difficulty of holding the tire securely on the rim of the wheel is a problem that has taxed the ingenuity of manufacturers continuously since tires were made.

Bolts, wires and bends are the means ordinarily used; of these, the beaded-edge tire engaging a rim with a hooked edge is the most popular, with the wire edge or straight-side type growing in favor by reason of superior ease in mounting and dismounting. Both are makeshifts, however, made necessary by the character of the best material heretofore available for

John F. Palmer, inventor of the cord tire for bicycles which was used first in 1893 and also the Palmer cord tires for automobiles now used in England and the Silvertown cord tire used in this country, is still engaged in the further development of this type of tire.

tire construction, namely, square-woven canvas fabric.

It is not my intention to dwell needlessly on the shortcomings of square-woven fabric, but I felt the necessity of pointing out in a general way the major objections in its use in tire construction, in order that the reason for cord tires and their advantages be made as clear as the limits of this article will permit.

The writer is at present developing a new type of cord tire, which differs in that a ribbon or flat cord approximately $\frac{1}{2}$ inch wide is used instead of the round cord. The chief object in substituting it for the round cord is that it allows of different construction whereby you can do away with all beads, wires, or any other method of fastening to the rim, and can have a tire which with a pressure of not over 40 pounds cannot be thrown from the rim of a racing car at any speed as was demonstrated on the Indianapolis speedway a year ago. The use of inextensible flat cords permits of their being placed in the tire at a tangent to the rim, that is right angles to the spokes of the wheel, which is the position to obtain the most efficient transmission of power from the rim to the tread. This

ourselves of the whole strength of each individual cord in the tire. The whole number of cords being so assembled as to work as a unit, we have as a result a structure without seam or joint; perfectly balanced as to opposed layers and disposition of their strength.

There yet remains for consideration the matter of fastening. In the flat cord tire we have dodged this question completely, the matter of secure attachment to the rim being incidental to the design of the tire. The disposition of the cords or bands in themselves, without addition of beads, wires, bolts or any other extraneous means, provides a security of attachment and ease in mounting and dismounting far beyond anything heretofore obtained.

So much for the points considered in square-woven construction. Now in what degree does this type of tire meet the other important points as first enumerated?

I have covered air-pressure and weight of vehicle and load, as to the power impulse of motor and the reverse strain of braking; it is axiomatic that force is transmitted in straight lines, hence, that tire in

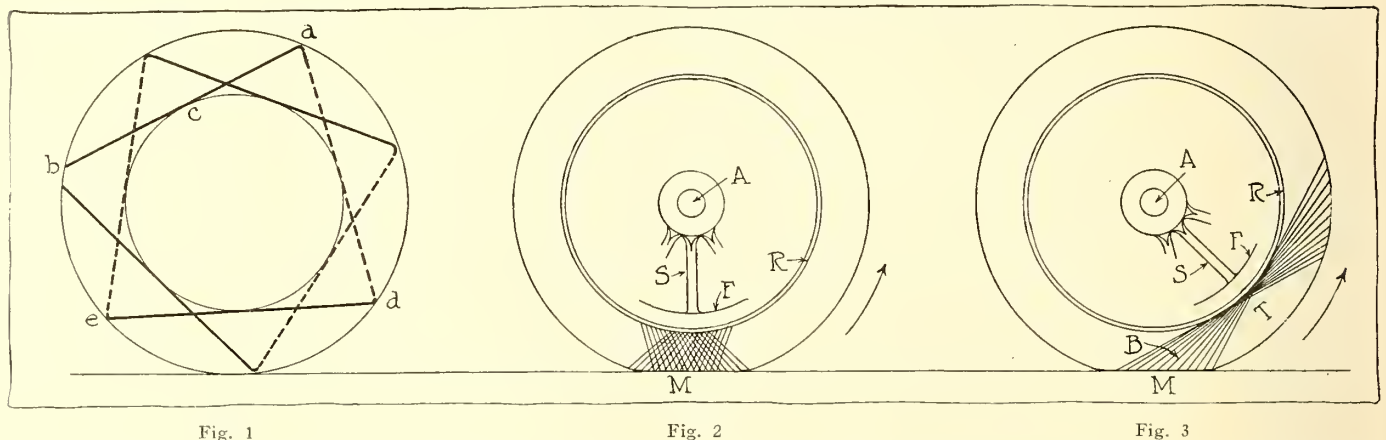


Fig. 1

Fig. 2

Fig. 3

Fig. 1—Left—Construction of the Palmer flat-cord tire, showing how the cords are at tangent to any point *c* on the rim, one cord being represented by the line *a b* which, after crossing the tread at *a* continues at *d*. Similarly, all cords are tangentially placed or at right angles to the wheel spokes.

Fig. 2—Center—Shows the threads in the fabric tire with sharp angularity to the wheel rim. *S* indicates wheel spoke, *R* wheel rim, *F* felloe, *A* axle, and *M* that part of the tire which supports the weight, which is a relatively short section of the tire.

Fig. 3—Right—Shows a section of the ideal flat-cord tire with the cords *B* arranged as tangents to the rim. The cords cross the tread at *M* and are distributed over a wide fraction of the wheel circumference so that the tire throughout a majority of its circumference forms a bridge construction supporting it at the point *M*.

also is responsible for using air pressures approximately half what has been used in fabric tires.

Now, again passing the question of air tube and tread as satisfactorily solved in present day practice, I will attempt a parallel statement of the answer the Palmer flat cord tire gives to the same questions above considered.

First: A so-called cord tire is built on a form of the natural shape of a tire, using thread or cord, singly, or a number of threads held parallel by rubber as a band or ribbon and used as such in the construction of the carcass of a tire, by applying single flat cords at a predetermined angle and continuing such application until the tire carcass is complete and consisting of two or more layers or thread, cord or bands, each layer laid at an angle to its next inside or outside neighbor.

As to the question of strength, each flat cord being laid individually as best meets the conditions of its use and protected in action from the friction or cutting movement of cross threads we are able to avail

which the threads or cords best meet this condition will translate into motion or work a larger proportion of the power delivered at the rim by the motor through transmission, shaft, axle and wheel.

Now, inasmuch as the material connecting the last rigid point in the power chain with the road, against which the power is exerted, is soft and flexible, it must be used identically in office and position, as a belt on a pulley to get the best results, that is, the flat cord must be laid at a true tangent from the rim, or at a right angle to the spokes, and by reason of the long, flat arch described by each cord in the tire, it has under it a longer column of the supporting air. This reduces the air-pressure necessary to carry a given load, with a corresponding reduction in total strain due to air-pressure and strength required to meet it.

The above applies also to the reverse strain of stopping the car by means of brakes and contributes as well the ideal of maximum transverse rigidity necessary for positive control of the car through the steering wheel, the least motion of which is answered

in full by the car to the skidding point of the front wheels. Also the blows of road inequalities are met by lower air pressure per square inch, hence a better, more receptive cushion against shocks or vibration.

The ideal tire then would be:

1—One on which the vehicle is enabled to move along the road without shock or vibration due to inequalities of surface. This means easy riding, coasting quality, receptiveness.

2—To do this with the least expenditure of power per ton-mile; this means a combination of the coasting quality and efficient power transmission.

3—To control its course with absolute certainty up to the limit of wheel traction. This is steering wheel control, had by transverse and longitudinal rigidity in the tire carcass.

4—To bring it to a full stop in the shortest space of time. This is braking efficiency, and also is obtained by reason of longitudinal and transverse rigidity.

5—To be immune from puncture or other injury from external causes.

6—A method of attachment to the rim that is positively secure under all conditions of service yet admits of easy mounting and dismounting, and, I might add, all these without any attention whatever from the user. This latter is almost as attainable in some of the others as perfection.

Since it is impossible to incorporate in one structure the maximum of all these ideal qualities, the tire designer is obliged to sacrifice in some measure the ideal in order to achieve the practical. For instance, easy riding, the quality first enumerated, if carried to extreme would necessitate the use of a power plant out of all proportion to the work to be performed, even though the third quality, control, were not lost, as it would be in the above construction. No. 4, on braking efficiency, also is unattainable under the conditions of maximum cushioning quality or receptiveness. No. 5 would remain much as in other constructions, while No. 6, rim attachment, would be made very much more difficult than in any other type of tire. In short, the maximum of this quality of receptiveness or easy riding is an impossibility in a practical tire.

Nos. 2, 3 and 4 are bound up together and the maximum of number 2 results also in the best expression of 3 and 4.

The fifth desideratum, immunity from puncture, is impossible of achievement in an air tire without great loss in all the foregoing, and, inasmuch as a simple pure puncture is extremely rare, we can disregard this feature and devote our efforts to the elimination of rim cutting, blow-outs and pinched tubes. This latter trio embraces 95 per cent of the trouble in pneumatic tires, aside from faulty material and construction. Rim cutting is due to bad association of rim and tire; this may mean any one of several faults covered by the above phrase, sometimes of the tire, sometimes of the rim and sometimes careless placing of the tire edges when it is put on the wheel, and often when ridden with very low or no air pressure.

Blow-outs in tires, when not due to faulty manufacture, are the result of bruises, unfilled cuts in the thread which permit moisture and rot in the fabric, and breaking along the hinge or bending point through undersized tires being used, with consequent high air pressure necessary to carry the heavy overload. Fif-

teen per cent is the maximum depression permitted in the Palmer tire; other tires are safe only at 10 and 12 per cent depression.

The sixth ideal feature is had in the ideal tire, and in no other; the same construction that contributes maximum power, steering and brake efficiency contributes also a method of attachment that is really no attachment; that is, on inflation, the tire becomes practically a part of the wheel. This last word in joining tire and wheel has been the hope and despair of tire inventors since double-tube tires were made.

It is obvious that a tire composed of flat cords must have something to distend it forcibly in order that it may resist distortion. *This is the air pressure.* Also there must be a rigid base for the air to push against in order to distend the tire at all. *This is the rim.*

Now, as the lines of resistance, the cords must under the pressure of the air try to take the shortest route between their opposite points of attachment, the rim sides, in a canvas tire, and the cords being flexible and the pressure elastic, they will then describe an arch from one side of the rim to the other of a span dependent on the length of the cord. Now if this span describes an arch shorter than a double tangent and the rim edge, the tendency of the contained air pressure must be then to lift the tire bodily from the rim, proportionately as its angle departs from a true tangent. Hence, the various fastenings in current use of both clincher and straight-side wire edge types.

Now, in the ideal tire the lines of resistance, or the cords, describe the longest possible span in crossing from one side of the rim to the other, approximately a true double tangent as illustrated in Fig. 1. It will thus be seen that no cord stops at the rim *c*, but goes straight across to the opposite tread point *a* or *b*. It will be evident then that the lines of resistance of these cords describe what might be called the shortest route from a point on the tread of the tire to another point on the tread of the tire coinciding with a point on the rim falling within a straight line between these two points. We used to call this the chord of an arc in our school days.

Now, therefore, if the lines of resistance, or the cords, are not attached to the rim at all, but only pass within the flange of the rim across to opposite tread points, the ideal tire cannot be said to be attached to the rim, but that opposite tread points pull one against the other. For it must be remembered that there is no strength in a tire to resist air pressure beside the treads of which the carcass is composed, and these treads one and all take the identical course above described.

Hence, the impossibility of the radial pressure of the contained air lifting the tire from the rim in the smallest degree, as the tire simply is pulling against itself and the flanges of the rim only serve to restrain it from lateral expansion.

It seems opportune that a word as to the limitations of the pneumatic tire as a shock or vibration absorber be added here. Manifestly, this must be limited to its ability to receive into itself inequalities of and on the road surface, hence, the size of the tire again is vital and is its measure in cushioning equality, the springs assuming this function according to their ability when taking bumps beyond the capacity of the tire. In this connection, I would say that the best pneumatic tire is susceptible of as nice adjustment to its load, in size and air pressure, as are the springs.

Should Dealers' Parts Accounts Be Standardized?

A Plan by Means of Which This End May Be Brought About

THE subject of this treatise can be answered by one word—Yes, in favor of a standardized plan.

It is generally stated that the life of an automobile is from seven to ten years, and when a manufacturer sells a car he assumes an obligation to supply parts for that car as long as it is in use.

The handling of a service department is a business within itself, and the responsibility rests upon us to handle this business, which is increasing in volume every year. We are daily studying problems whereby we can render the best service possible, and while studying these problems we must consider that we have to satisfy the car owner, the dealer and the manufacturer, which makes it somewhat of a problem in a great many cases, but if the method of handling these details can be standardized, it will no doubt relieve these conditions considerably.

If a standardized method is adopted, I would suggest that it be made as simple as possible, for, as you no doubt know from experience, no matter how simple or how explanatory the method may be, it is rather hard to get certain types of dealers to follow instructions or handle the proposition in a business-like manner.

For example, I was in a certain territory last week and was introduced to one of our subdealers, who immediately brought up the question as to credit for a certain part which he returned to the factory. After considerable conversation, I found that he had returned the part by express from a town other than the one he lived in, and had never forwarded a claim blank or written a letter notifying us as to the trouble or who or where the part was from.

Without close care, a branch can become overloaded with a quantity of surplus in a very short time, and, as the factory parts stock department generally estimates

BY B. H. REMSEN

fore you for discussion, I am going to suggest outline of a plan for the handling of the parts accounts with dealers, and will also offer a few problems for discussion which I personally have come in contact with in handling our parts department.

In contracting with a dealer, the dealer should place a deposit which would guarantee his parts account, the amount of deposit being based upon the volume of business for which he contracts.

It might be a good plan to offer a small cash discount as an encouragement to the dealer to pay his parts account promptly the 10th and 15th of the month following date of purchase. Parts orders from a dealer's territory should be forwarded through him, and he should stipulate whether they are to be charged to his account or shipped C. O. D. If the latter, he should specify discount, if any. I would think it advisable that all possible pressure be brought to bear upon dealers to eliminate C. O. D. shipments.

The dealer should be protected for parts shipped into his territory, provided the order comes through him. I do not think it advisable to protect the dealer on sales made in his territory where the order was not forwarded by him. This would create an incentive for the dealer to get in touch with all sub-dealers and car owners in his territory, and thus have the greatest possible volume of the business come through him, relieving us of considerable responsibility.

A dealer should be charged with transportation on parts shipped on his order but refused by consignee.

The dealer should prepay charges on all parts returned to the factory, either defective or new, and the claims department should allow him credit for such charges, provided the inspection department decides it is the fault of the company.

If a dealer's parts account exceeds his deposit and his financial standing does not warrant any further



Hollywood Garage, Chicago.



This Garage Has Every Facility for First-Class Service.

its maxima and minima by sales made by the branch, this would no doubt create a surplus at the factory. I note from the program that each question will be open for general discussion. In order to bring this be-

credit, he should be immediately placed on a C. O. D. basis and parts forwarded to him less his regular discount. He should not, however, in such cases, be allowed the special discount for cash.

Collection of Refuse in England

Comparative Operating Costs of Electric Vehicles as Against Horse Drawn Vehicles

THE Electric Supply Company, Birmingham, England, has ordered two electric vehicles, which are to be hired by the refuse disposal department, on terms agreed upon, for use in the Harborne district in the collection of house refuse from portable ash-bins. The refuse is what is termed "dry refuse," and is now collected by four horses (with one reserve horse), drawing four-wheeled wagons. It is intended that the two electric vehicles shall replace these five horses.

A day's test was made in the Harborne district with an electric vehicle of 6 cubic yards capacity on December 8, 1914, the work of two-horse trucks being taken, and the table following shows that the work was accomplished in 8 hours 20 minutes.

The same vehicle was also used for six consecutive days in the Lifford district under similar conditions to the Harborne test.

A third test was also made during the night in the neighborhood of the Aston destructor in the collection of midden or privy refuse, and the work of three horses was attempted. The average weight removed by three horses in one night is 12,600 lbs. The vehicle removed in less than six hours 3,200 lbs. more refuse. I am of opinion that for this particular class of work, which throughout the country is a diminishing quantity, one electric could do the work of four horses. The load is obtained quickly, and the fullest advantage can be taken of the fast-traveling electric. If the "pits" are scattered and the distance to be covered considerable, the vehicle is shown to still greater advantage when compared with the slower movements of the horse.

The table gives details of this night's test.

The three tests confirmed my opinion that electric vehicles have established themselves sufficiently to justify municipalities giving their support, perhaps at present in a somewhat limited degree, to their development. I am only directly concerned in their use in the removal of house refuse, and indirectly, as a member of the Institute of Cleansing Superintendents, in their adoption for sweeping and watering of streets and collection of street sweepings.

The accepted sanitary method of storage of domestic refuse is in galvanized circular bins of a convenient size, not holding more than one week's refuse, so as to be readily portable and easily handled by the dustmen. Three trials with electric vehicles have been made in Birmingham in the removal of domestic refuse, and each trial fully demonstrated that one electric could easily displace two horses. In my opinion the following reasons fully justify an extended trial of electric vehicles:

- (a) The cost appears to justify an extended trial.
- (b) In this city there are 275 horses engaged in connection with refuse disposal work. If electrics were adopted the number of vehicles would be reduced by half.
- (c) All the refuse removed has to pass over a weighing machine, so that the clerical labor would also be reduced to the same extent.
- (d) The supervision by outside inspectors of half

the number of vehicles should be either less expensive or more ef-

fectively performed.

(e) The expense of accidents resulting from horses getting out of control and moving on while the dustmen are at rear of premises would be avoided.

(f) The littering of streets with horse manure, and the consequent expense of cleaning same, would be considerably reduced, whilst the improvement and benefits resulting in cleaner streets, especially in areas where the dwellings of the poor are close to the roadway, would undoubtedly assist in a reduction of "filth diseases."

(g) The electric vehicle can be lighted by current contained in the storage battery, and the superior light thus obtained would materially reduce the number of accidents which now occur in many cases through the badly lighted horse-drawn vehicles.

A horse and wagon in this city removes three wagon loads of refuse per day, which entails the vehicle stopping at approximately 150 houses per day. This at once rules out of court the gas vehicle, which, as is well known, materially depreciates by repeated stoppages. Such is not the case with the electric vehicle, and this alone constitutes one of its main features in its adaptability for the work of refuse removal.

The operation of the cars is quite simple, and the horse drivers could, in most cases, be readily trained to drive them. The local conditions of all places should be taken into consideration when organizing a scheme of collection, as they vary considerably. In Birmingham the "flat system" of dwellings is a negligible quantity, the dwelling houses being practically all self-contained. There are few back streets, and the refuse is stored in the bins at the rear of the houses, and in many cases a considerable distance down the gardens. As a result, it has to be carried by the dustman in nearly all cases a considerable distance. The trials with electric vehicles proved that three dustmen and a driver were necessary, the driver helping to lift the bins on to the wagon. The number of loaders required, however, would have to be ascertained according to the conditions peculiar to the district in which the men were working.

The trials in this city proved that the "traveling" of the vehicles was only 30 minutes per load, as against two hours in loading, and the men were enabled to take their meals under proper conditions, instead of a "snack" in the streets. It may be argued that where more than three journeys are run and the men are not traveling to the depot to get their meals, the time might be occupied in bringing out the full bins on to the footpath. It must be borne in mind that in nearly all cities the portable bins belong to the householders, and must, therefore, be returned to their proper places after emptying. I have visited all the principal cities of Great Britain, and many on the Continent, and am decidedly of the opinion that such a method is not an acceptable or desirable one in large centers of population, and that the ratepayers prefer to pay a little more for the work than tolerate such an unsightly and insanitary system. Anyone who has watched the rag

pickers or sorters in certain Continental cities, and also in England, must be convinced that it is not desirable that encouragement should be given to people to earn their livelihood in such a way.

I was favorably impressed with the electrical tip-

greatly reduced as compared with other mechanical methods in use. The highest point of the sides of the wagon should not be more than 5 feet from the ground, in order that the loaders may readily tip the refuse into the wagon.

—	Loads.	Time taken journey.	Time loading.	Weight removed.	Time taken on inward journey.	Time loading and traveling.	Approximate distance covered.	Time tipping loads.
Totals	3	35 mins.	6 hours 15 mins.	Not weighed.	1 hour 5 mins.	7 hours 55 mins.	16 miles	30 mins.
Averages .....	..	12 mins.	2 hours 5 mins.	....	22 mins.	2 hours 38 mins.	5.3 miles	10 mins.

Results of Experiment with Edison Accumulators (Ltd.) Electric Vehicle Collecting Night Soil on the Night of December 10, 1914.

—	Loads.	Time taken on outward journey.	Time loading.	Weight removed.	Time taken on inward journey.	Time loading and traveling.	Approximate distance covered.	Time tipping loads.
Totals	4	40 mins.	3 hours 31 mins.	7 tons 18 cwt. 1 qr.	35 mins.	4 hours 46 mins.	18.3 miles	28 mins.
Averages .....	..	10 mins.	53 mins.	1 ton 19 cwt. 2 qr.	9 mins.	1 hour 12 mins.	4.6 miles	7 mins.

REMARKS.—Left depot for first load 11:20 p.m. Men took 20 minutes for supper between 2nd and 3rd loads. Arrived at depot after four loads 5:05 a.m.

ping arrangement on the Edison vehicle. This is an electrically-operated device, put into action by a simple reversing switch. A small electric motor gives the bodywork a direct thrust backwards through the medium of a reduction gear and square threaded screw of ample proportions. The body is provided with rollers, which run on a steel runner-path of special

I have obtained the figures given in the foregoing table from estimates by the makers and as a result of our own tests. It will be noticed that there is a considerable difference in first cost between the two vehicles under consideration, but the net financial results are approximately equal, and especially so if the capacity of the two vehicles is taken into consideration.

—	Three tons. Capacity, 8 yds.	2½ tons. Capacity, 6 yds.	3 tons. Writer's revised estimate assuming that 3 tons is carried.	Two horses, harness and wagons, 3 tons.
<i>Capital or First</i>				
Cost of electric vehicle, complete with chassis, battery, tyres and motors	\$53.75	\$32.50	.....	\$12.50
Cost of two horses, harness and wagons.....	.....	.....	.....	.....
<i>Running Cost per 135 Miles per Week—</i>				
Wages of driver.....	\$8.25	\$8.25	\$8.25	.....
Electrical energy at 1c per unit.....	1.93	2.00	3.43	.....
Tyres, assuming a 10,000 miles' life.....	3.64	2.50	3.64	.....
Repairs, replacements and maintenance of chassis.....	1.66	2.00	2.39	.....
Battery upkeep, etc. (Edison's give guarantee at end of 60,000 miles, or equal to eight years' running, that all cells shall be capable of developing full rated capacity; Mossay's provide for batteries being renewed every two years).....	1.12	5.62	5.62	.....
Insurance	1.00	1.12	1.00	.....
Miscellaneous—viz., garage expenses, viz., washing, body repairs, charging, etc.	1.87	1.87	1.87	.....
Depreciation on basis of 10 years' life and interest on capital outlay at 4 per cent per annum.....	12.25	6.10	7.35	.....
Wages of loaders: Electric vehicle (three at \$7.50 per week)....	22.50	22.50	22.50	.....
Two ash wagons (two at \$7.50 per week)....	.....	.....	.....	\$15.00
Hire of two horses and vehicles in the City of Birmingham....	.....	.....	.....	36.00
	\$54.22	\$51.96	\$48.70	\$51.00

profile, such that when the body is pushed backwards a tilting motion is also given to it. This arrangement possesses the advantage that the bodywork is stable in all positions, whilst the center of gravity travels almost horizontally; thus the amount of energy used for tipping and the time taken for the process are

It should be noted that the "Edison" vehicle is rated to carry a load of 3 tons, as against 2½ tons with the "Mossay" vehicle. A fair comparison would, therefore, appear to be as follows:

	First Cost.	Weekly Cost.
Mossay vehicle	\$3,700	\$55.58
Edison vehicle	5,375	55.27
Two horses and vehicle	1,250	51.00

With the Edison machine there is also attached an electrical tipping arrangement, in place of a hand-worked screw tipping gear on the Mossay vehicle, which is valued by the makers at about \$250. A weekly wage of \$8.75 has been allowed for, being an advance of \$1.25 on the amount paid to horse drivers.

It has been decided to have Ironclad Exide batteries in the two Mossay vehicles on order in place of the ordinary lead type. These are made by the Chloride Electric Storage Co., Manchester, and I am informed that there are several thousands of them at work in America. They are, as regards performance, about half-way between the lead battery and the Edison bat-

tery, and the advantage of them is that they can be charged on a constant voltage with a tapering current, and consequently require no regulation and no attention when on charge, as is the case with the ordinary lead battery. The Electric Supply Committee have decided to maintain the batteries themselves in order to ascertain exactly the cost of upkeep, and a reliable figure should be obtained at the end of two years, and the sinking fund to be set aside is estimated to be sufficient to renew the batteries. A costing system of all work in the Refuse Disposal Department is in operation, and a fair trial will be given the electric to demonstrate its superiority over the horse.

Battery Vehicles as an Adjunct to Street Cars

A Discussion of Electric Busses and Battery Consumption in England

DURING the past three years experience with many types of

W. L. WATSON

battery vehicles has been so satisfactory that it is endeavored to direct the attention of tramway authorities to the virtues of this method of propulsion. The past difficulty has been to provide a means of storing electricity; the accumulators put into service were solely of the lead-acid type, which, owing to its great weight and inability to withstand not only high rates of charge and discharge, but also vibration, soon proved commercially unsound. Briefly reviewing the batteries now available, we still have the original flat-plate battery, for which the makers claim great improvement in their method of formation. We also have a new type of lead battery, called the Ironclad-Exide, which differs in many respects from the older type, and which the writer believes to be the best of lead accumulators. Both of these types of batteries have the inherent troubles of all lead accumulators, but by careful maintenance and strict adherence to the manufacturers' instructions a good case can be made in their favor for certain classes of work. Another type of battery which is finding much favor in this country is the Edison nickel-iron cell, the introduction of which has opened to the battery vehicle a sphere of usefulness in which no other battery can successfully compete. This accumulator is built throughout of nickel and steel, the electrolyte being a solution of potash and lithium. The time available will not permit me to detail the differences of the three batteries named, beyond showing in mileage and money the performance to be expected with each type. The following table will show the desired information, and it will be for those interested to decide whether it is better to pay a smaller initial cost with a heavy maintenance charge or a heavier sum with a proportionate saving in these later expenses.

involving a capital expenditure of \$90,000 for the installation of fifty-six-passenger, double-deck trams, and the necessary depot complete with charging equipment and the extension of mains. The running costs were guaranteed not to exceed 11 cents per car mile, covering write-off of capital, labor, and all running charges. If this installation is made it will be the first of its kind in this country, but there are existing trams working on this principle in the United States. It is interesting to note that battery rail cars, capable of carrying forty passengers with a total weight of fifteen tons, average a current consumption of 600 watt-hours per car mile; maximum speed thirty miles per hour; miles per charge of battery 100.

COMPARISON BETWEEN THREE DIFFERENT TYPES OF BATTERIES OF 150/165 AMPERE-HOUR CAPACITY.

150 A.H. Flat-plate	11-12 KW. H. . .	List price, £ 85
150 A.H. Ironclad-Exide	11-12 KW. H. . .	" " 150
150 A.H. Edison Nickel-Iron	11-12 KW. H. . .	" " 216

TOTAL COST OF OPERATION OVER 60,000 MILES SERVICE.

	Lead.	Iron-Exide.	Edison.
Guaranteed mileage...	nil.	18,000 to 20,000	60,000
Plate maintenance... 3c per mile.		20,000	.....
Fair mileage to expect	6,000	.....	150,000
Original cost.....	\$425	\$750	\$1,080
Plate maintenance for 54,000 miles at 1½d.	\$1,687.50	.....	.....
Renewal of plates at 70 per cent. of original cost (£105) × 2, representing 40,000 miles .....	.....	\$1,050	.....
Plate maintenance....	.....	.....	nil.
Total cost of battery at completion of 60,000 miles	\$2,112.50	\$1,800	\$1,080

The battery omnibus will probably prove to be the more popular method of building up routes, prior to the extension of a full tramway service, owing to its cheaper installation and greater mobility. These buses are already installed in Southend, South Shields, York, West Bromwich, and Loughborough. In the first three instances the results have been very gratifying, the vehicles not only having given a highly satisfactory service, but the low running costs expected having been proved conclusively. At Southend-on-Sea, where one battery-driven bus was installed to run on equal terms with a fleet of petrol and petrol-electric buses, a saving of 10 cents per mile, plus halfpenny

In towns such as Morecambe, Lancashire, where the conduit system is barred owing to the possibility of interference with the service by incursion of the sea, not to mention the high cost of such an installation, and where the overhead system is regarded as a menace to the scenic surroundings, the battery tram will be of great service.

Horse trams have operated successfully for many years. With the advance of time electric traction has been seriously discussed, with the result that a scheme for installing battery-driven vehicles was considered,



Waverley Electrics Enroute on Sociability Run.

profit to the electricity department, making a net saving of 11 cents per mile, has been shown in favor of the battery vehicle.

At South Shields I find that the current consumption per mile varies between 1.63 and 2.10 units, the variation being specially noticeable owing to the road surface conditions encountered and variable weather. The maintenance charges have proved very slight, and with such a low average weekly revenue as 11.84 cents, the service covers expenses.

At York Mr. Hame announces that the four Edison buses have run 13,600 miles with an overall energy consumption of 1.1 units per mile.

The installation of buses at West Bromwich and Loughborough has only recently been made, consequently running costs are not yet available. They will be of special interest, as they are to cover routes previously occupied by petrol-driven chassis.

The ideal method of employing these vehicles is to fix a terminus at which point the vehicle awaits passengers for a few minutes. Here current can be taken at a high rate of input. The time taken to replace sufficient current (at six times the normal rate) to cover one mile of even road surface is one and a half minutes. Therefore, a stay of four and a half minutes will in many cases replace sufficient current to cover the major part of a journey. At Southend-on-Sea it is no infrequent occurrence for the battery bus to return to its garage at night with no more than 40 ampere-hours used out of a total capacity of 300 ampere-hours after a day's journey of 100 miles. Where "boosting" facilities cannot be arranged, a larger size battery may be necessary; but a mileage per day of 45 to 50 miles could easily be accomplished, provided the district is not of an extremely hilly nature. Upon hills the vehicle proceeds at a reduced pace, and where considerable gradients are met this is sometimes reduced to little more than a crawl. It should be appreciated, however, that it is possible to run buses under these conditions at a running cost which will render light services profitable, or at least self-supporting, whereas either petrol or petrol-electric buses would prove uncommercial.

It must not be assumed that the battery vehicle is incapable of speed; speed can be accelerated provided the current supply is in proportion to the distance to be traversed. The "electric" has been developed to travel at a useful speed under the most economical conditions. It is a peculiarity of the vehicle that when under way it appears to be journeying at a much slower speed than the mileage really registered. Including stops, it has been found capable of averaging a speed of $7\frac{1}{2}$ miles per hour. This compares very favorably with the London bus, whose average rate of

travel is approximately eight miles per hour. It seems unwise to develop a new route under speed conditions, which can only result in a short life owing to the high running costs. The service will be much better appreciated if it is run upon conditions which the route can afford, thereby insuring permanency.

Where the district is so scattered that a vehicle becomes a matter of necessity to the manager when doing his round of inspection, an electric roadster or coupé seems an ideal car to suit his purpose.

But for the condition of the country during the past year a new vehicle would have been placed upon the market suited for the conveyance of members of the staff on their duties. This vehicle is designed on very light lines similar to the petrol-cycle cars, which have become so popular. It is believed that such a vehicle would find much favor as a means of conveying inspectors, also for the collection of coppers, distribution of tickets, etc., etc. This vehicle, it is hoped, will not exceed a cost of \$1,500. Upon a similar chassis will be mounted a trade body of the box variety. This has been specially designed for the use of tramway departments in connection with their parcel delivery service. Here, again, low price has been given the utmost consideration—initial cost will be approximately \$1,370. So great will be the advantage of such a vehicle to parcel delivery services that it seems likely a number will be employed once the low running costs have been suitably demonstrated. Assuming that an average mileage of 30 miles per day is accomplished during 300 days per annum, and current can be obtained at two cents per unit, including current, maintenance, tires, insurance, depreciation (seven years), and interest at an average rate of 5 per cent, the total costs will not exceed 11 cents per mile.

The tramway departments of Ilford, Derby, and Belfast employ battery-driven tower wagons, each of which amply satisfies their requirements. These vehicles have a speed of from 11 to 12 miles per hour, which is generally found sufficient for the traffic to be negotiated. When out of service the opportunity is seized to revive the battery. The mileage available per charge is from 40 to 45 miles, which has proved more than sufficient for a day's work.

The battery will provide current for operating electric drills, saws, and riveters for bonding, and any other small tools in which either power or heat is required. It will be easily realized what an immense advantage it is to the testing engineer to have a large capacity battery at 70 volts available at any section or feeder pillar for testing purposes during times when the network is dead.

For maintenance of the track and road repairs a vehicle of two or three tons carrying capacity would

be of great general utility. For carrying materials such as pillars, setts, and other weighty equipment required on permanent tracks or extensions this vehicle will do all that is required, and by provision of an interchangeable tank body of 500 gallons capacity a further field of usefulness will be provided for watering at any time when current is not available. This same vehicle has been utilized for carrying cables and drawing them into the ducts. It may sometimes be found useful for removing cars from a section where a breakdown has occurred, thus releasing the vehicles to proceed on their journey.

In the short discussion which followed Mr. Watson's résumé of the paper, W. T. Robson mentioned his satisfactory experience of the working of battery buses at South Shields. Such a bus would mount a short steep gradient as quickly as a petrol 'bus, but on long steady gradients its speed fell off seriously, and this would have to be altered. It was excellent for service on flat roads, such as those around York, and the passengers liked it. The Shields battery buses gave no trouble in maintenance, and were changed at night by unskilled labor. The only maintenance work was the cleaning of controller contacts and filling up the batteries once a week. The design was very good indeed, and he asked whether it would not be possible to overcome the speed difficulty by the introduction of an arrangement for switching extra cells in when hill-climbing is necessary.

The cost of the battery bus, however, was much too high, and, unless it was reduced, petrol buses would be adopted in preference.

Mr. Harvey recommended every tramway manager to get a battery tower wagon. The one used on his own undertaking cost about \$3,275, and had a speed of some 10 to 12 miles an hour. In addition to its normal work, it would lift a 60-foot tramway rail; it had given no trouble in service.

Mr. Wyld referred to the tests carried out at Hampstead with electric dust vans and to the considerable saving in cost experienced over horse traction.

Mr. Watson, in reply, said experiments were being made to overcome the speed difficulty referred to by using change-speed gear. He suggested that extra cells would introduce difficulties in the charging, etc. He agreed that high first cost was an obstacle, but those who paid the price did not seem to be dissatisfied with the result. In conclusion, he mentioned that the Derby tramways were now using an electric tower wagon and were considering the purchase of battery-driven buses.

Mr. England, in closing the meeting, said, in reference to the prevailing difficulty in obtaining tramway material, that some concerns were very short, and as an association they must press the government to facilitate delivery of such material. Further, in order to save expense, etc., it was intended to ask the Board of Trade to incorporate any proposals for extension of time for carrying out provisional orders.

New Heat Treating Furnace for Springs

Detroit Steel Products Company Installs Mammoth Oil Burning Furnace

TO insure a continuous and absolutely even high temperature in heat treating automobile springs, the Detroit Steel Products Company has just installed a mammoth new oil burning rotary furnace in its plant at Detroit, Mich. The furnace, which was designed and built by the plant engineer, has the general appearance of a big mushroom with the stem cut off. It is 26 feet in diameter, 81.7 feet in circumference, and is the only furnace of its kind in existence.

Operated by electricity, the floor revolves, making one complete revolution in from 20 to 30 minutes. The speed, however, can be regulated by a variable speed motor.

Jets of air and fuel oil placed at intervals around the outside circumference, shoot into the furnace at a great velocity through vents left in the walls. The oil is ignited through contact with the heated interior of the furnace keeping its temperature at a height of from 1,450 degrees to 1,575 degrees Fahrenheit. Ten pyrometer couples register the temperature, and an electric signal board notifies the operator whenever the temperature threatens to get too high or too low. This enables the operator to keep the furnace at an even temperature.

To treat a large outfit of springs in the old type of furnace, it was necessary to heat the furnace to a considerably lighter temperature than that desired for the springs themselves. The steel was brought to the required temperature quickly and removed before it became too hot. The rotary furnace is heated only to the temperature required in the steel. The steel attains this heat slowly and remains in the furnace only till it reaches the exact temperature. There is no opening and closing of

doors to cause intermittent drafts and make the heat difficult to control. One small door is sufficient.

One crew of men is kept busy removing the heated plates as the revolving floor brings them into position, while another crew inserts other leaves. The new furnace does the work of four or more ordinary furnaces. Its operation requires seven men and it treats about 50,000 pounds of steel per day.

When the furnace is in operation, the springs to be treated are placed cold on the revolving floor. During the revolution they gradually attain the maximum heat of the furnace.

They are taken out at the end of the revolution and hardened in oil baths, the oil being kept at an even temperature through the agency of an air and water circulating system which maintains a temperature of about 90 to 120 degrees Fahrenheit.

The oil flows from the bath to submerged tanks under the floor of the factory building. From here it is pumped through an elaborate system of pipes on the roof. These pipes have two compartments, one for water for cooling purposes, and one for the oil.

The oil after passing through the pipes is then returned to the baths at the temperature required.

After leaving the baths the springs, which have been treated in the rotary furnace, are passed on to the "draw furnaces." Passing through these furnaces on an endless chain conveyor for thirty minutes at a maximum temperature of about 900 degrees Fahrenheit, the "temper" or hardness is modified to give the metal the necessary tensile strength and ductility required by the severe service given to an automobile spring.

Increasing Business with Electric Trucks

Possibilities of Widening Application as Seen by the "Electrical World"

SEVEN central stations have proved the value of a new plan for selling electric vehicles for commercial service. For three years this sales plan—the battery-service system—has been in successful operation in different locations and has stood the test of service under a variety of conditions. This plan is perhaps the first in which the needs of each of the three parties interested in the sale of trucks—the manufacturer, the central station and the user of the vehicle—have been considered.

Now is the strategic time for every central-station manager to interest himself in this method of increasing the sales of electrical energy. The time is opportune first because the prospective purchaser is right now scrutinizing the item of delivery cost in his costs of doing business; second, because the electric vehicle has certain specific advantages over any other type of vehicle for meeting the user's problem; and, third, because the war has caused an unprecedented situation in the truck manufacturing field.

Why have no more electric trucks been put into operation? Primarily because of a misunderstanding between truck maker, central-station manager and truck user as to just what each had to offer and what their common interests were. The maker has furnished the vehicles and has thought of himself as selling simply an electric-driven truck. The central-station manager, recognizing the possibility of the truck as a means of selling energy, has thought of the vehicle as an energy-using device. But the primary interest of the user, the man both central station and truck manufacturer wish to reach, is in transportation with its clustering group of individual requirements. The user wants to buy transportation. And if a proposition can be made to him on that basis, a proposition that for the same or less cost gives him better delivery service, that is the proposition which will broaden the market for both the manufacturer of the vehicle and the manufacturer of the electrical energy, the central-station manager. Such a proposition has been put into practice by the central stations in Hartford, Boston, Baltimore, San Francisco, Fall River, Worcester and Spokane, in co-operation with the General Vehicle Company. It is called the battery-service system of the General Vehicle Company.

The meat of the proposition is this. The truck user buys a truck with chassis and body adapted to his particular requirements without the battery. The central station keeps him supplied with charged batteries to run this truck. He goes to the central station, in other words, not to buy energy at so much per kilowatt-hour, but to buy transportation service. He pays the central station a flat charge for garaging and battery maintenance depending on the size of his truck. In addition he pays so much per mile for the total mileage traveled as indicated by the odometer on the truck.

Merely listing the advantages of this plan to each of the three parties concerned indicates far-reaching possibilities for widening the application of the electric commercial vehicle.

The user gets a simple, effective and modern vehicle of transportation for less money. The truck without the battery takes from 20 per cent to 25 per cent less capital at the start. In one stroke the user standardizes

his delivery costs, cuts out his stable or garage expense, and buys transportation on a basis he can understand and measure.

Under the battery-service system of the General Vehicle Company, the truck purchaser's very original investment is reduced from 20 to 25 per cent, from the very practical viewpoint, the sale of the truck is made that much easier. The vehicle user merely operates the car. He need not concern himself with what may be to him the mysteries of electricity. There is no limit to the number of miles he can drive the car each day. Freshly charged batteries can be exchanged for a depleted set whenever unusual demands on the truck require it.

The centralizing of the income from the costs of delivery to the user at the central station has quite as practical advantages to the central station. This income results from three sources, first, the garage charge, details of which will be presented later in this article; second, a ready-to-serve charge, based on interest, maintenance charges, renewals and freight; third, a charge for energy consumed reckoned for the truck user on a per-mile-run basis. Tabulated statements of income per mile as charged the user by the central station are shown with this article.

Just what each of the parties in the centralizing of transportation performs is made clear in the standard contract used by several of the central-station companies in developing this source of income in their respective cities. The contract has in some instances been printed on a 5-inch by 9-inch sheet, so that when folded it may be filed in a 3-inch by 5-inch drawer as a record of the agreement in the office of the central station. The printed form of the contract, of course, may vary, but the essential elements are contained in this résumé:

"To all owners or users of electric automobile wagons or trucks manufactured and equipped by the General Vehicle Company, Inc., for such service who will sign the application annexed hereto, and whose credit is satisfactory, the [insert here corporate name of operator], hereinafter called the company, will furnish battery service and inspection service as described herein, and also garage service if the customer so elects, upon the following terms and conditions:

"1. The company agrees to maintain a centrally located battery-service station with facilities for the rapid exchange of batteries, and with an attendant on duty day and night, and to own, maintain and supply all 'Ironclad-Exide' batteries necessary for the operation of said vehicles, and that it will at such battery-service station supply the customer at any and all times during the life of this contract, and equip his wagons or trucks (manufactured by the General Vehicle Company, Inc., and equipped for this service) with said 'Ironclad-Exide' batteries of sufficient size and proper number of cells ready for use, and will, without unreasonable interference with the use of the wagons or trucks by the customer, from time to time as said batteries become entirely or partially discharged either recharge the same or exchange them for and install in said wagons or trucks charged batteries in accordance with the schedule of rates annexed hereto.

"2. The company agrees that at the time of exchanging or charging a battery it will furnish the cus-

tomer's driver upon application with a coupon stating the number of miles which the battery should propel his wagon or truck under ordinary conditions. The company will make a towing-in charge for cars stalled by reason of exceeding the stipulated mileage.

"3. The customer agrees that the legal title to the batteries furnished by the company under this service shall be and remain in the company, and that he will return said batteries to the service station where such service is supplied at such times as shall be prescribed by the company's rules.

"4. The customer agrees to protect and care for the batteries while in his possession, and to return the same to the company in good condition, reasonable wear and tear thereof incurred in the normal operation of the

schedule of service-system charges, and that if for any reason the odometer should fail to register, the mileage during the period of such failure shall be estimated from previous records on the customer's vehicles until such time as the odometer can be replaced or repaired by the company, and the customer shall pay the cost of repairing or replacing such odometer.

"7. The customer agrees that he will maintain his wagons or trucks, keeping them in repair and proper condition, and that he will allow the proper representative of the company to inspect or test his wagons or trucks at any reasonable time during the term of this contract for the purpose of ascertaining mechanical and electrical conditions and the accuracy of the odometer, and will immediately remedy any defective conditions

PRICES PER MONTH						
	Boston	Spokane	Baltimore	San Francisco	Hartford	Charges Recommended*
1000-lb. wagon:						\$19.00
Garaging	\$19.00	.....	\$19.00	.....	\$ 8.33	\$19.00
Battery service and inspection.....	17.00	\$40.00	17.00	\$42.50	14.00—	17.00
Rate per mile, 0 to 500.....	.03	.03	.03	.03	.03	.03
Rate per mile, 501 to 750.....	.02½	.02½	.02½	.02½	.02½	.02½
Rate per mile, 751 to 1000.....	.02¼	.02¼	.02¼	.02¼	.02¼	.02¼
Rate per mile, excess of 1000.....	.02	.02	.02	.02½	.02	.02
2000-lb. wagon:						
Garage	19.00	.....	19.00	.....	8.33	19.00
Battery service and inspection.....	21.00	42.50	21.00	45.00	21.00—	21.00
Rate per mile, 0 to 500.....	.03½	.03½	.03½	.04	.03½	.03½
Rate per mile, 501 to 750.....	.03	.03	.03	.03½	.03	.03
Rate per mile, 751 to 1000.....	.02½	.02½	.02½	.03½	.02½	.02½
Rate per mile, excess of 1000.....	.02¼	.02¼	.02¼	.03½	.02	.02¼
4000-lb. wagon:						
Garage	19.00	.....	19.00	.....	10.00	19.00
Battery service and inspection.....	28.00	50.00	28.00	55.00	—	28.00
Rate per mile, 0 to 500.....	.05	.05	.05	.05	.04½	.05
Rate per mile, 501 to 750.....	.04½	.04½	.04½	.04½	.04	.04½
Rate per mile, 751 to 1000.....	.04	.04	.04	.04	.03½	.04
Rate per mile, excess of 1000.....	.03½	.03½	.03½	.04½	.03	.03½
3½-ton truck:						
Garage	23.00	.....	23.00	.....	.....	23.00
Battery service and inspection.....	33.00	60.00	33.00	65.00	—	33.00
Rate per mile, 0 to 500.....	.06	.06	.06	.06	.06	.06
Rate per mile, 501 to 750.....	.05½	.05½	.05½	.05½	.05	.05½
Rate per mile, 751 to 1000.....	.05	.05	.05	.05½	.03	.05
Rate per mile, excess of 1000.....	.04½	.04½	.04½	.05½	.03	.04½
5-ton truck:						
Garage	26.00	.....	26.00	.....	.....	26.00
Battery service and inspection.....	36.00	70.00	36.00	75.00	—	36.00
Rate per mile, 0 to 500.....	.07	.07	.07	.07	.07	.07
Rate per mile, 501 to 750.....	.06½	.06½	.06½	.06½	.06	.06½
Rate per mile, 751 to 1000.....	.06	.06	.06	.06½	.04	.06
Rate per mile, excess of 1000.....	.05½	.05½	.05½	.06½	.04	.05½

Garaging includes the garage space, washing, oiling, greasing and ordinary minor adjustments. If the vehicle is not garaged by the company, this charge is omitted.

Battery service and inspection include readiness to serve with electric energy in exchangeable batteries, to enable the customer to run his vehicle at any time, and inspection as to the condition of the vehicle at the station of the company.

*The charges in this column are those included in the contract form which the General Vehicle Company has standardized for the customer. These standards are based on preliminary experience accumulated by the different cities listed and by the General Vehicle Company. Variations in charges for battery service and inspection are caused by variations in freight rate on batteries. The standard charges for rate-per-mile costs tabulated in the last column are recommended by the General Vehicle Company as maximum charges after wide investigation and analysis of local conditions, rates for energy and so on.

vehicle excepted. The customer agrees not to make any repairs to the batteries but to notify the company.

"5. The customer agrees to supply a suitable odometer to register the number of miles traveled by each truck or wagon for the purpose of determining the price for the battery service in accordance with said schedule of service-system charges, and the company will have the same checked for accuracy at all reasonable times on the request of the customer.

"6. The customer agrees that the number of miles registered on the said odometer shall be the basis for computing all mileage charges in accordance with said

called to his attention which would result in excessive energy consumption.

"8. It is mutually agreed that the company assumes no responsibility for the customer's wagons or trucks by reason of loss or damage due to fire, nor by reason of loss due to accident or other causes.

"9. It is mutually agreed that the customer, if desiring to withdraw any of his wagons or trucks from service, may for a period of not less than one month have the charges for service for the same canceled, provided that advance notice is given the company in writing of his desire to do so. After such suspension of service,

the customer shall give at least two weeks' notice in writing of his desire to have such service reinstated. The charge for garage service shall not be canceled unless the customer withdraws his wagons or trucks from the garage of the company.

"10. All bills shall be rendered monthly and paid by the customer within fifteen days, and if not so paid, the company shall have the right to remove the batteries from the wagons or trucks. The company may serve written notice on the customer of his default, and if such bills are not paid within ten days after such notice, at the option of the company this agreement may be canceled and terminated.

"11. Garage service shall consist of and include garage space, washing, cleaning, oiling, greasing and ordinary minor adjustments. If the vehicle is not garaged by the company, the garage charge in the annexed schedule is omitted.

"12. These terms and conditions shall not be binding upon either party until the signed application of the customer has been accepted by the company, and they may not be modified or affected by any promise, agreement or representation by any agent or employee of the company unless such modification is in writing and executed by a duly authorized representative of the company and by the customer."

The schedule of rates recommended by the manufacturer is presented later in the article.

ADVANTAGES OF CENTRALIZED CONTROL.

One of the chief advantages in the method of sale as outlined in this agreement is that of centralizing batteries for the group of cars so purchased. Every central-station manager believes in the axiomatic principle of centralizing the production of electrical energy for a community or group of communities. The central battery-service plan is another extension of the well-recognized advantages of such centralization of the generation and distribution of energy.

The storage battery is merely another method of transmitting energy from a central source. It provides a method of transmission to the customer in a form which he pays for on a basis he understands. From the central-station viewpoint, moreover, the investment in batteries becomes productive as soon as made, and this investment is paid back to the central station on the installment plan by the service charge made to the merchant. The title to the battery remains in the hands of the central station.

The centralizing of the batteries makes possible a flexibility in and maintenance of the cells otherwise impracticable. Charging can be put on a better time basis at the central station. It can be carried on in valley periods in the station load and, at the same time, experience has shown that the extra batteries available at the central source make possible a service to the vehicle user impossible when charging periods and maintenance are circumscribed by the comings and goings of one owner's trucks only.

At first sight, it may seem that the guarantee to supply fresh batteries at all times would mean an unusual investment in storage batteries by the central station. Practice shows, however, that such is not the case, and that the number of batteries required to give such service is not three or four times the total single equipment per vehicle but is a fractional proportion only of such extra batteries. The law of averages works to reduce the investment in batteries to a minimum, and the greater the number of trucks in service the fewer proportionally become

the extra batteries required to guarantee a continuous service for the trucks. From one and one-half batteries per vehicle, with perhaps twenty-five trucks, it works down to one and one-third or less.

Centralization of the batteries also makes it possible for the central station to control the type of battery and to make engineering adjustments in character and type as may be necessary to fit the electric truck to the service which local conditions demand. Similarly, questions of initial battery cost and maintenance can be worked out with a large group of batteries more intelligently and at less expense per unit than is possible when the batteries to be recharged are scattered locally among a variety of users charged and maintained under varying conditions.

RESULTS OBTAINED IN PRACTICE.

Because of the average user's vital interest in reducing his costs of doing business, now is the time to present to him the advantages of the electric vehicle for putting the item of general delivery cost on a better basis. The fact that the plan has now been successfully tried in widely located sections shows the possibilities of its adoption for developing business in many other communities. Seven public service companies have adopted the plan—the Hartford Electric Light Company, the Washington Water Power Company, the Edison Electric Illuminating Company of Boston, the Consolidated Gas, Electric Light & Power Company of Baltimore, the Fall River (Mass.) Electric Light Company, the Worcester (Mass.) Electric Light Company, and the Pacific Gas & Electric Light Company of San Francisco. Each has adopted the battery-service system as a method of stimulating the sale of energy in their communities.

The plan was first adopted by the Hartford Electric Light Company of Connecticut. A description of the application of the system in that city was given in the September 6, 1913, issue of the *Electrical World*. The plan was introduced in February, 1912, with fourteen cars operating under the battery-service system. Two years later more than three times as many cars were in service, and in January of this year a gain of 50 per cent over the number of cars in operation during 1914 was accomplished.

Experiences of the several companies indicate that the main features of the plan can be applied under a wide variety of conditions. The initial trial of the system in Hartford was followed by two years' observation of the plan in operation. The officials of the Hartford Electric Company paid especial attention to advertising in the newspapers the adaptability of the electric vehicle to local use. Just what had been accomplished by local users and emphasizing in straightforward style the advantages of electric trucking formed the basis of this newspaper campaign. Repeat orders were capitalized in copy. One coal company substituted electric for gasoline-driven trucks and the discarded gasoline vehicles were offered for sale by the Hartford Electric Light Company. The advertising copy emphasized the fact that electric trucks had been substituted by the coal company. San Francisco and Spokane have also called newspaper advertising to their aid in promoting the battery-service system.

Any operator of any vehicle shall stop upon the request of any police officer in uniform or exhibiting his badge. An operator shall exhibit his certificate and license upon request, and shall furnish all information in his possession as to his identity and that of the owner of said vehicle.

PERSONAL NOTES

Day Baker of the General Vehicle Company has just returned from a trip to California, where for some time past he has been seeking better health. On his return he was offered and has accepted a most important promotion.

When Mr. Baker decided to enter the automobile truck field, some seven or eight years ago, his many friends felt that perhaps he had made a mistake in electing to become identified with the electric truck in place of the gasoline. But the years of success terminating in his appointment to a higher position have proved that no error was made by him in the selection. It is really only fair to say that perhaps it was not the especial kind or make of machine selected, as those in the automobile trade who know Baker best say that undoubtedly with his business ability, tact, judgment and hard work, he would have succeeded in reaching success with any line he might have selected.



Day Baker, General Vehicle Company.

It is announced that Day Baker has been appointed manager of the agency sales, foreign sales and central station department of the General Vehicle Company, Inc. During the years with this company as its New England manager, Day Baker has made hosts of friends among the merchants, manufacturers, automobile dealers and electrical men of New England, and they all rejoice with him in this recognition of his hard work.

Mr. Baker is, and has been since its organization, the treasurer of the Boston Commercial Motor Vehicle Association; for four years he was president of the Boston Electric Motor Car Club, and for three years was treasurer of the Electric Vehicle Association of America. He is a member of the Boston Chamber of Commerce, Boston City Club, Engineers' Club, National Association of Cotton Manufacturers, National Electric Light Association, Bay State Automobile Club, and many other associations. He is a Knight Templar, Mason, and Odd Fellow, and for years was very active in the Royal Arcanum.

The business of the General Vehicle Company in its American and foreign agencies has been growing rapidly for some time, and Mr. Baker's business associates all feel that he is just the man to systematically organize these departments and put good business arguments and the life and optimism needed into sales departments. In the central station or electrical field there could be no better man selected, as he is well-known all over this country by those in the electric development field, and he has the electric education so essential for the successful carrying on of business with the men of the electrical world.

We predict that Day Baker's success in the new fields, in which he is to act as the guiding hand, will, with his ripened experience, be greater than that he has attained in his successful introduction of the electric truck in New England.

"Round House" Care for Trucks

That more commercial motor vehicles fail to give satisfactory service because they are not operated and cared for properly than because of inferior design and construction is a fact well known to transportation engineers. The modern motor truck and delivery wagon are built to withstand hard service, provided they are cared for properly in the garage.

"Roundhouse attention" is the name given to this requirement and it is taken from railroad parlance. Its significance in this case is that the motor vehicle should have the same careful attention at the end of each day's work that the railroad locomotive receives at the end of

each trip. If the locomotive requires inspection and adjustment at the end of a run over smooth steel rails, how much more should a motor truck receive the same after a long day's work over rough roads, in which it is jolted and strained in a way a locomotive is never subjected to. The time required for this is seldom longer than it takes a horse driver to unharness, clean and feed his team at the close of a day's work.

Such attention pays for itself many times over in dollars and cents. There is almost as much opportunity to increase motor truck efficiency in the garage service as there is in providing proper loading and unloading facilities or in routing deliveries. The railroads furnish an illustration of this, in that the total cost per locomotive mile for the four leading lines running out of New York in one year varied from 4 to 16.6 cents, and the lowest figure was for the line with the severest grade. This variance of nearly 400 per cent must be largely attributed to the difference in maintenance service.

Interesting statistics pertaining to the cost of operating electric commercial vehicles are to be found in the report of an investigation recently conducted by electric vehicle interests. This investigation embraced 145 fleets, totaling some 3,000 motor trucks operated in 30 different cities. One result was to show the following average daily costs for the various load capacities: One-third ton, \$5.68; one-half ton, \$6.34; three-quarters ton, \$7.02; one ton, \$7.56; one and one-half tons, \$8.15; two tons, \$8.92; three and one-half tons, \$10.38; five tons, \$11.74.

The cost analysis included investment, spare parts, equipment, garage equipment, on the total of which 3 per cent interest was charged to annual operating expenses. These expenses also included depreciation at 10 per cent, liability and fire insurance and license fees. Maintenance included tire up-keep, battery up-keep and mechanical up-keep. Electric power, supplies, labor, rent, light, etc., were charged to garaging. Drivers' wages were charged to operation and salaries and office expense to administration. Current was figured in all cases at four cents for k. w. h. and wages were average at \$2 a day for light delivery wagons, \$2.50 a day for one to three-ton trucks and \$3 a day for heavier trucks.

Vehicle Operators Barred From Drink

A single drink of liquor imbibed by operators of automobiles will result in licenses being forfeited immediately, provided State Motor Vehicle Commissioner H. A. Roe is convinced that the licensee has been guilty of consuming intoxicants while at the wheel of a car. This edict has been issued by Commissioner Roe and he has spread it broadcast in a crusade his department is waging against reckless driving.

You can buy an electric truck today with the same certainty of what it will do under your particular circumstances as you can buy any other staple commodity.

Any level-headed business man can, and constantly does sell himself electric trucks, and soon as he has the facts before him.

Electricity is now the world's best source of power, and enables business men to "team by electricity."

Volkcar Quality Batteries

For Electric Vehicles

¶ The Anderson Electric Car Company, manufacturer of Detroit Electrics has been using our batteries in Chicago for five years and are guaranteeing them for 15,000 miles.

¶ That's what the largest electric car manufacturer in the world thinks of Volkcar batteries.

Electric Vehicle Batteries renewed and parts furnished for either passenger or commercial electrics

VOLKCAR STORAGE BATTERY CO.

2441-43 Michigan Avenue, Chicago

Your Personal Subscription

would prove both a convenience and a means of real profit. Each issue of *Electric Vehicles* is of interest and practical value to every man in the industry. If you miss one copy, you may miss an article or an idea that would have a vital effect on your work.

As a regular subscriber, you would be able to read *Electric Vehicles* carefully and systematically at your leisure, and to preserve a file of copies for reference and for binding.

Bound volumes of *Electric Vehicles* will form the best foundation for a reference library.

We suggest that you have the magazine sent to your residence. Remit \$1.50 for a year's subscription to

Electric Vehicles

Monadnock Building

CHICAGO

Philadelphia

THIN PLATE BATTERIES

"Diamond Grid"

CAPACITY
ECONOMY



LIFE
MILEAGE

*For Pleasure and Commercial Cars.
For Sparking Starting and Lighting*

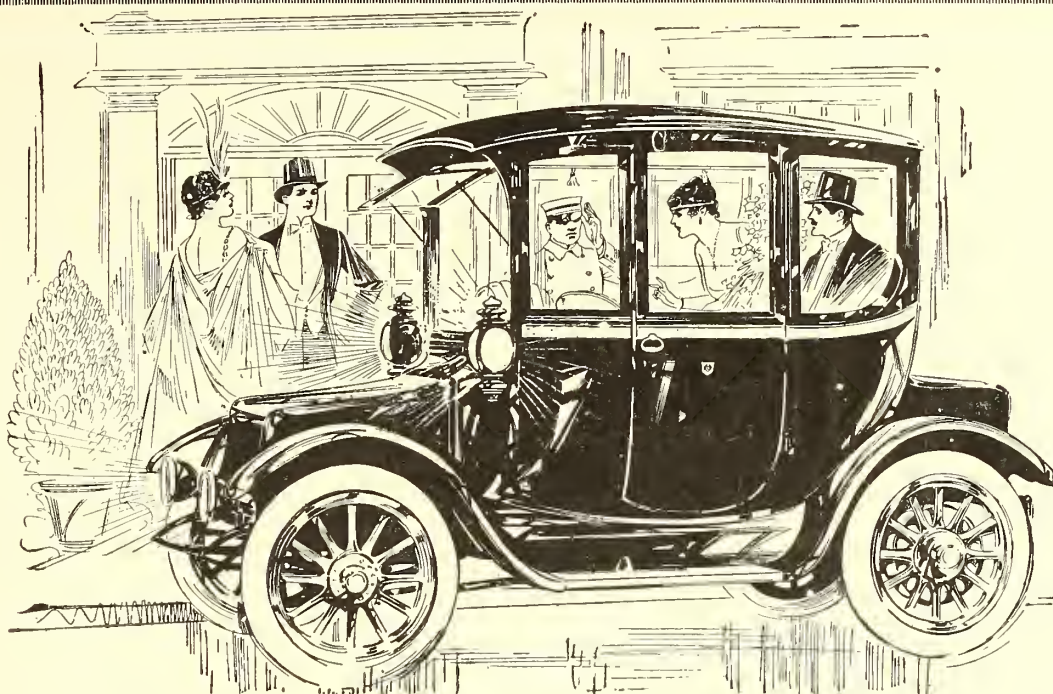
WRITE FOR CATALOGUE

PHILADELPHIA STORAGE BATTERY COMPANY

ONTARIO AND C STREETS
PHILADELPHIA, PA.

DEPOTS AND AGENCIES

NEW YORK	BOSTON	CHICAGO	CLEVELAND
WASHINGTON	DENVER	ROCHESTER	ST. LOUIS
BUFFALO	SALT LAKE CITY	MINNEAPOLIS	KANSAS CITY, MO.
CINCINNATI	TORONTO	SEATTLE	PORTLAND, ORE.
OAKLAND	SAN FRANCISCO	LOS ANGELES	SACRAMENTO



Culture's Car

There is a distinct place in Car-dom which only the Electric Automobile can fill.

For those who live in town or suburbs it is the one logical car.

Because more than mere utility is imperative. There is the further requisite of quality—of refinement—of fashion—of that extra "something" which bespeaks true culture.

This is realized by those who own both gas and electric cars.

Ownership of a Rauch & Lang or Baker Electric indicates an appreciation of that exact car service resulting from actual automobile experience.

As Chicago distributors of both these famous makes, we are taking gas cars as well as electrics in trade.

For as dealers of both gas and electric cars we can operate on a broad, unbiased scale. No other institution we know of is equipped to offer such advantages in both lines.

Hence we welcome the privilege of serving you, whether you want to buy a new electric outright—or wish to turn in your old car, gasoline or electric, as part payment.

**Rauch & Lang
Electrics**

"THE SOCIAL NECESSITY"

Call or phone,
suggesting
an appointment at
our place
or your own

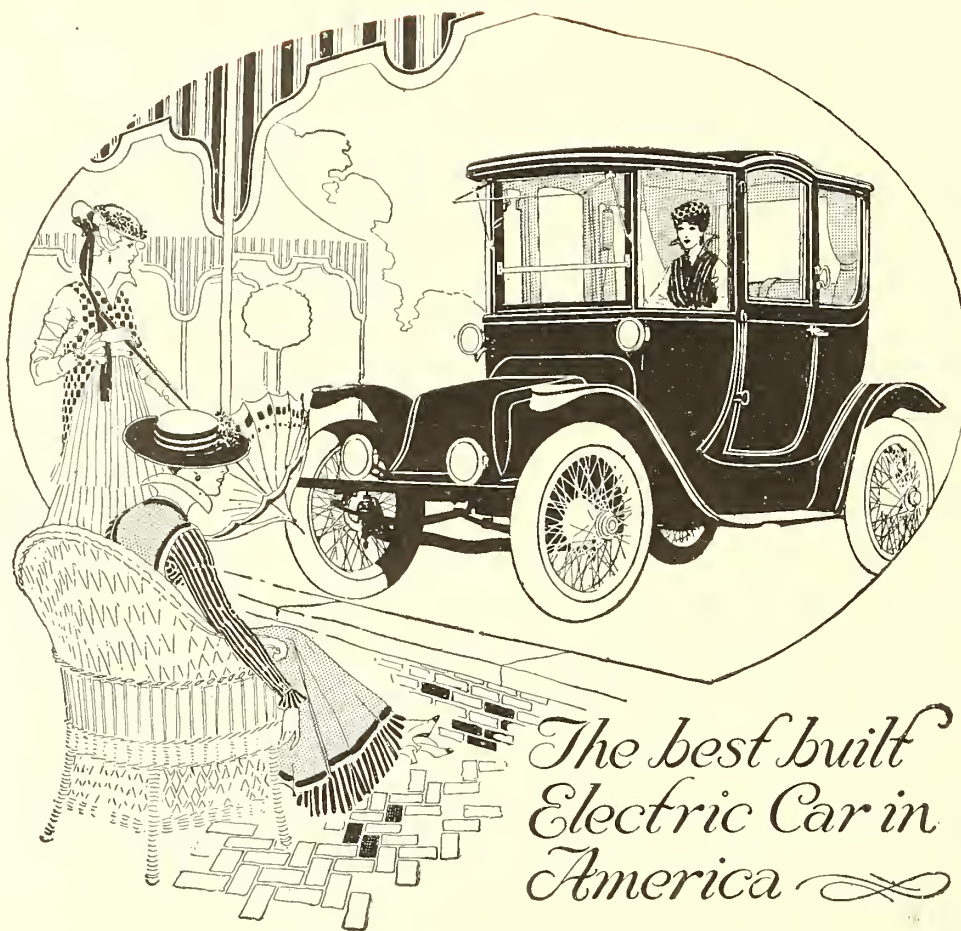
**Baker
Electrics**
QUALITY SERVICE

The McDuffee Automobile Co.

Chicago Distributors of
RAUCH & LANG and BAKER
ELECTRICS. NATIONAL and
PEERLESS GAS CARS.

2457 S. Michigan Ave., Cor. 25th St.
TELEPHONE CALUMET 4812

A CHICAGO CAR FOR CHICAGO PEOPLE



*The best built
Electric Car in
America*

THE builders of Chicago Electrics have STAND UP QUALITY uppermost in mind. That is why Chicago Electrics after covering from twenty-five to thirty thousand miles, continue to give the height of satisfactory service. Owners of

Chicago Electrics

have not been forced to sell or trade for other electrics because no other electric car offers equal reliability, economy and comfort. The latest construction in every detail that scientific engineering can produce is found only in this car. Backed by interests of unquestioned strength and commercial standing, the Chicago Electric offers every advantage to the discriminating buyer.

FOUR OR FIVE PASSENGER CLOSED CARS
FRONT OR REAR DRIVE
FOUR PASSENGER CABRIOLET ROADSTERS
\$2,275 \$2,450 \$2,600

WALKER VEHICLE COMPANY

EVANSTON BRANCH
Clark St. and Benson Ave.
Phone Evanston 481

*Built in Chicago:
Used by the Nation*

CHICAGO SALES
2700 Michigan Ave.
Phone Calumet 3000

ELECTRIC VEHICLES

A MAGAZINE FOR THE ELECTRIC CAR OWNER. \$1.50 PER YEAR. 1253 MONADNOCK BLDG.

Vol. 7

CHICAGO, SEPTEMBER, 1915

No. 3



GENERAL VEHICLE ELECTRIC TRUCK IN PARCEL POST SERVICE

Detroit Electric

Doubled output for 1916 reduces prices as low as \$1975

August 15 we reduce the price \$600 to \$725 per car

Remember — these are the same high quality cars as our 1915 models plus a score or more of 1916 refinements. Even while lowering the price, we bettered the car. In the 1916 Detroit Electric, you will find — we believe — the top place car of its type. We urge you to match it — if you can — in elegance, quality, utility, or value in the entire closed car field — gasoline or electric. This price reduction is possible only because of doubled output.

Investigate At Once

and learn why the 1916 Detroit Electric is the preferable car for you.

Buy an Automobile as you would a Bond — study the security back of it.

You get these savings

Our doubled production leads to many economies in all overhead expenses, in purchasing, in advertising, in sales cost, in engineering. All the savings effected by our larger operations we hand on to you — and take our benefit from doubled volume.

Here are the 1916 prices F. O. B. Detroit

Model 61 4-Passenger Brougham	(Formerly \$2,600) — Now \$1,975
Model 60 5-Pass. Duplex Drive Brougham	(Formerly \$3,000) — Now \$2,275
Model 59 5-Pass. Rear Drive Brougham	(Formerly \$2,950) — Now \$2,225
Model 58 5-Pass. Front Drive Brougham	(Formerly \$2,950) — Now \$2,250
Model 57 4-Pass. Rear Drive Brougham	(Formerly \$2,850) — Now \$2,175
Model 56 3-Pass. Cabriolet	(Formerly \$2,650) — Now \$2,075

You may have either the worm bevel or the worm gear, wire or wood wheels, cushion or pneumatic tires, as optional equipment

Increased Efficiency — Hence — 15,000 Mile Battery Guarantee
for Chicago Delivery

Anderson Electric Car Company

(Manufacturers Detroit Electrics)

World's Largest Builders of Enclosed Pleasure Cars

Direct Factory Branch,

2416 Michigan Avenue, Chicago, Ill.
D. E. Whipple, Manager,

Published Monthly By

ELECTRICITY
MAGAZINE
CORPORATION

Monadnock Building
CHICAGO

Entered at Chicago Post Office
as Second Class Mail Matter

ELECTRIC VEHICLES

WITH WHICH IS INCORPORATED IGNITION

TRADE MARK REGISTERED IN THE UNITED STATES PATENT OFFICE

SUBSCRIPTION PRICE

Domestic - \$1.50
Canada - \$1.75
Foreign - \$2.00

FOR SALE AT ALL
NEWS STANDS

If Your News Dealer Will Not
Supply You—Please Notify Us

Volume VII

CHICAGO, SEPTEMBER, 1915

Number 3

Educational Wave of Sociability Runs

The Value of Systematized Tours for Creating Public Confidence in the Electric for Long Distance Performance

WHEN we hear repeatedly of the many successful tests made of the endurance and country-running ability of the electric vehicle by various manufacturers, we must conclude definitely that the use of an electric is no longer confined to city streets and boulevards. We have so long been accustomed to thinking of the electric as the town car, par excellence, that it has not occurred to us that it will give just as delightful and satisfactory service on rural trips in this day when charging facilities have become so well developed and numerous. While it will always remain the favorite car for city use, the electric in time will become just as great a favorite for interurban trips and short tours. It is a matter of educating the owners of electrics to operate their cars with greater temerity and to make wider and more general use of them. Such series of runs as the Anderson Electric Car Company carried on not long ago in Detroit when one of its stock model broughams made as much as 112 miles on a single battery charge, and the recent endurance runs conducted by the Beardsley Electric Company when the car registered over 1,500 miles in 14 days, show that there should be no doubt about the electric's ability to cover ground. The solution of the problem of getting electric vehicle owners to use their cars more extensively lies in the promotion of sociability runs.

BY A. JACKSON MARSHALL*

There is nothing new about the idea. It has been tried sporadically for a number of years, but the time has come for a more systematic and continuous effort to introduce them into all parts of the country. The problem of organizing such runs in cities where the number of electrics warrant such a performance is being met and solved by various electric vehicle interests. With an organization of live and progressive men to start the ball rolling, and the co-operation of electricity supply stations, manufacturers, garages and owners themselves, everything should conspire to make the runs a success.

In emphasizing sociability runs, it is not the purpose to recommend stunts in the nature of mileage test runs, speed contests and the long cross country tours. These are all variations of the sociability run and have advertising value, but are not so educational as where the owners themselves take part. When the owners of electrics and their friends participate, they not only learn of the advantages and capabilities of the electric, but they also familiarize themselves with traffic regulations while passing through town and city streets on their way to the country districts.

In anticipation of electrical prosperity week, scheduled for November 29 to December 4, 1915, the Electric Vehicle Association of America has gathered together various data on how to organize and conduct sociability

*Secretary, Electric Vehicle Association of America.



A View of Beardsley Electrics En Route on Test Run.



Mrs. Volney Beardsley and Official Observers Attending Test Run.

runs. It is the firm conviction of the association that the introduction of such runs is the very best way to educate the public in the country running ability of the electric and dispel the idea that it is necessarily a car for city streets only. It is hoped that many runs of this nature will be organized during this prosperity week, and that the results will be far-reaching in breaking down existing prejudice.

The following suggestions for conducting runs are based on the experiences had in successfully organizing them, especially in Washington where they have met with great popularity and success. In cities where the association has a section it has not been found necessary to have a special committee to handle the work, the run being managed by members of the main executive committee—those members who are car dealers taking the most active part. The preliminary work to be done is divided up and consists in making provision for the following: pennants, badges for committees, prizes, refreshments, and the selection of the route. The entries are made by individual owners, no dealer being allowed to enter his car in competition.

To cover the expenses of the run, an entry fee is charged; \$1 for cars carrying one or two passengers, and \$2 for cars carrying three or four passengers. Subscrip-



Beardsley Roadster Having a Speed of 40 Miles an Hour.

tions of from \$5 to \$15 are solicited from central stations, garages, car dealers, battery manufacturers, etc., to cover the balance of the expenses.

One of the most successful features of Washington sociability runs was the arrangement made for luncheon. Instead of serving the party at an inn, each car was provided with a luncheon box put up by the best and most fashionable caterer in Washington, and at the finish the participants, forming their own groups, voted the appetizing luncheons one of the most enjoyable parts of the run.

The prizes were bought from one of the leading jewelers, and while after the first two or three prizes, the remaining were necessarily small, they were the best of their kind obtainable.

As a great many of the entries are usually women, it is considered wiser not to have any contest that would test the skill of the drivers, and contests bringing out any one feature of a car are apt to result in unfavorable comparisons being made for cars not competing. In the Washington runs, it was considered that the route selected should not take materially over an hour to negotiate, and any entrant who was unable to complete the route in an hour and one-half, was disqualified. The only competition was against average time made by all contestants completing the run within the time limit—that

is instead of having a sealed time, as is so often done in sociability runs, the total elapsed time of all cars completing the run within the time limit were added and divided by the number of entries. The car making the nearest to this time was awarded the first prize, etc. This has been found an extremely satisfactory and fair method.

Over 1,500 miles in 14 days is the latest sociability run record. This extraordinary record in electric vehicle efficiency was made in the recent endurance test, held by the Beardsley Electric Company of Los Angeles, California. Mrs. Volney Beardsley volunteered to drive the car for the first 10 days, being accompanied each day by different women representing the press and acting as observers. During the last 4 days the car was driven by owners of Beardsley electrics, to further demonstrate the possibilities of an electric when driven by any careful operator. Mrs. Beardsley timed her days so successfully that in no case did the daily run fall below 100 miles, the average daily mileage being 106.6.

On the tenth day when she believed the test was coming to an end, she decided to make the longest record of the 10 days and registered 117 miles. In each case the day's run was made on a single charge of the batteries. The last 4 days increased the average to 107.5 miles per day, or a total of 1,505.6 miles covered in 14 days.

As to the battery efficiency, the owners themselves were not sure at the beginning whether the batteries, after being practically exhausted on 100-mile run each day, could be charged over night ready to repeat the performance the following day. They proved, however, that this could be done, not only for a second day, but for a steady two-weeks' grind, and upon examination of the batteries at the completion of this 1,500-mile run, the plates were in most excellent condition, showing that the car was probably capable of keeping up this same average for a long time. The runs were made over all kinds of California roads, covering different routes, the greater part of which were country runs over hilly ground. Each night the car came into the garage on its own power, showing that the batteries were never completely exhausted.

Plans Electrical Prosperity Week

The Society for Electrical Development has issued an attractive 20-page booklet about "The Plans for Electrical Prosperity Week Campaign," November 29 to December 4, 1915. The booklet explains the country-wide interest which has been created in this effort to interest everybody in doing everything electrically. Suggestions are given as to how central stations, electrical manufacturers, jobbers, contractors and dealers can co-operate in getting electrical organizations, department stores, merchants, schools, clubs and other organizations to boost the idea.

Details are given of the proposed advertising campaign in this connection. A striking design has been adopted for use on all poster stamps, street car cards, bill posters and other forms of display which are to be employed.

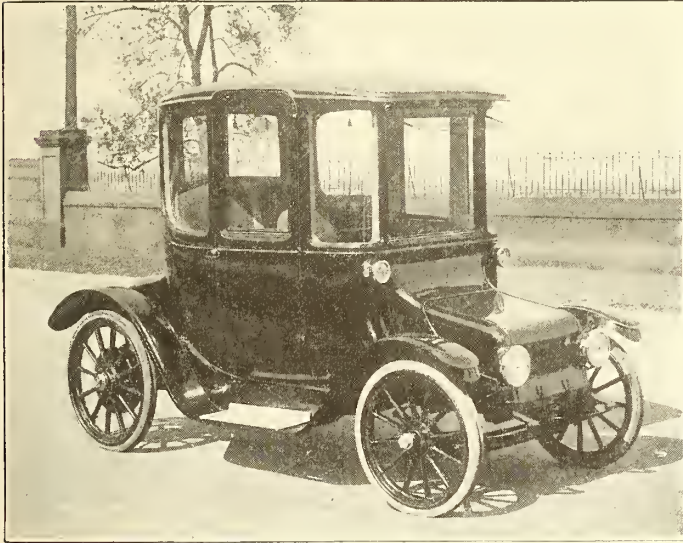
In New Jersey the motor vehicle department has sent letters to the police of all municipalities asking co-operation in the enforcement of the new regulation requiring the dimming of headlights. The notice suggests that until owners have been given an opportunity to become familiar with the provisions of the law the police defer arrests and depend on only warnings.

Chicago Electric Announces 1916 Models

Latest Models Show Many Mechanical Improvements at Considerable Reduction in Price

ADVANTAGES offered by great parts specialists, together with many economies in purchasing, sales and overhead expenses, make possible the continuance of highest grade construction in Chicago electrics at decidedly lower prices.

The substantial growth of Chicago electric car sales the past season has convinced the Walker Ve-



Chicago Electric Limousine, Model 152.

hicle Company that its new prices will make possible a most decided increase in its production for the coming season.

BODY REFINEMENTS

The body design of the new Chicago electrics, while having undergone several minor changes, still retains the general limousine lines. The arched doors will continue to give a distinctive touch of beauty as well as the practical advantages of additional head room and a means of draining the water to either side of the door in wet weather. The body construction throughout has been highly refined and a great many decided improvements made, for it has been found that more strength than ordinary carriage building affords, is necessary in the electric motor car constructed for the use of solid tires. This car will represent the highest attainments in genuine motor car body construction combined with all the comfort that master designers can create.

The more extensive use of aluminum, particularly for all parts that are exposed to the weather, will add greatly to the durability of the body construction. In the painting of these bodies, a new special finish process is used that will give even a deeper luster and more lasting finish than ever before attained on motor car bodies.

The new fender design of the crowned type, marks a decided improvement in the general outline of the car. They are fully skirted to the bodies to completely protect them from mud and water.

Sashless windows will be used, operated by improved mechanical lifts, which through the touch of

a lever, will open or close the windows, thus doing away with the twisting and turning necessary with the older type.

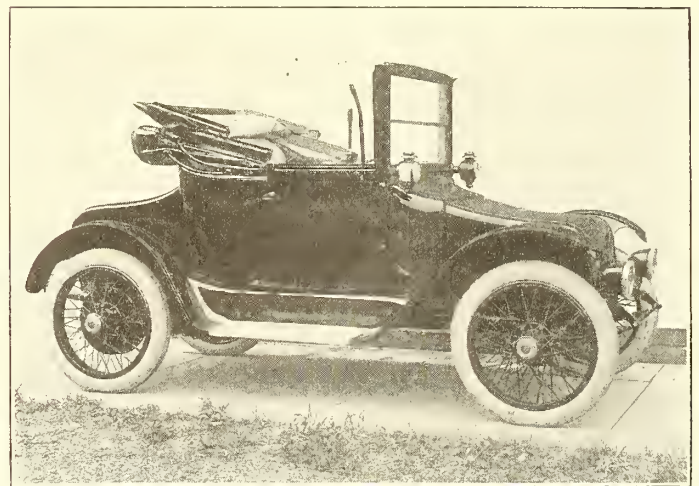
Decided improvements have been made in the mounting of the windows, the glass now being set deep in the frame of the body proper in a special cement, doing away with the use of keep-stakes, thus effectually overcoming any loose windows or leaks, which is very important for cars using the solid tires.

Every article that will add to the luxury and completeness of the interior will be found in these bodies, such as dome lights, reading lamps, arm rests, arm slings, the late type concealed toilet case and smoking set, clock, recording instruments, etc. The same type of front window will be continued which allows complete opening of the window in warm weather. In addition, an auxiliary rain shield will be furnished to give clear vision under all weather conditions.

DESCRIPTION OF MODELS

No radical changes have been made in these models over those of the past season, with the exception of such body improvements as have already been described, and numerous refinements. Models 151 and 153 are the ideal four passenger, rear seat drive, for all general purposes. These models are exceptionally spacious and will seat with every comfort, four passengers, as well as providing an emergency seat for a fifth.

Model 154 cabriolet roadster is designed primarily as a real utility car with all the frills and furbelows left off. This model offers the most desirable combination of open roadster and closed coupe. The rear seat is wide enough to carry three passengers comfortably, while an auxiliary folding seat will carry a fourth.



Chicago Cabriolet Roadster, Model 154.

This car is specially constructed for power, speed and mileage.

These three models are all built on a wheel base of 96 inches which combines the qualities for maximum riding comfort as well as the special feature of being able to turn completely in a very short radius, viz.,

34 feet. This short turning radius is a very important essential in the ease of handling the car, particularly in congested districts. Horizontal control is used which includes five speeds and a substantial mechanical brake operated by hand. In addition, the car is equipped with powerful foot brakes.

New price with full standard equipment is \$1,985.

MODEL 152

Model 152 is a front seat drive, 5 passenger limousine. Additional room is afforded in this model, the body averaging eight inches longer than the other models, and the seats a trifle wider. This model will offer ample room for the comfortable seating of five passengers. The wheel base of this model which is 104 inches, and an interior body length of 78 inches, gives the most luxurious comfort of any electric limousine built. While unusual body length is found in this model, which is essential to comfort and luxury, this car can be turned completely in 38 feet. It will be noted how well adapted this extreme short turning radius will prove, particularly for city driving. It is an extreme case when the Chicago electric requires reversing in order to turn completely in crowded streets. The same complete and luxurious body equipment in every detail, will be found worked out in this model.

New price with full standard equipment is \$2,150.

CHASSIS

While improvements have been made and new features added, the Chicago electric chassis follows very closely the successful principles which were established from the start. The frame is built into an extremely rigid unit, which gives a rigid foundation of great strength, particularly adapted to the use of solid tires. The most careful study has been given to proper weight distribution. The selection of steel used throughout has been given great attention. Marked improvements have been made in the lubrication of the car, particularly the steering, the number of places requiring grease being reduced to a minimum and equipped with large size grease cups, all accessible and within easy reach, making it unnecessary to get under the car.

The bronze bushings that have shown undue wear in the previous models, have been improved by the use of types that will give greatest wear. The same type of slow speed series wound motor is used with its advantages of high efficiency and minimum weight, as well as assuring reduced wear on bearings, brushes and commutators.

This motor is directly connected to a straight line drive shaft through double universal joints to rear axle. For hill climbing, this slow speed motor has decided advantages due to the reduction in heating tendency and the fact that its power is not due to an exceptionally high speed.

The control, continuous torque type with magnetic blow-out, remains practically the same with the exception of certain improvements made in its lubrication.

The controller is situated in weather proof metal casing against the motor, materially reducing the length of wiring and is readily accessible through a door in the floor of the car. No resistance speeds.

The controller system consists of five forward and reverse speeds, with brake operated by horizontal control lever, Yale locked. Speeds give a range of 5, 8,

15, 18 and 22 miles per hour, except on the cabriolet roadster, which reaches a maximum of 25 miles per hour.

This same control lever operates a ten-inch contracting band brake on the propeller shaft and has proven so satisfactory that no changes have been made.

Because of proper designing and the very liberal proportions, service records show a minimum average of 15,000 miles before relining is necessary.

The foot brake system remains the same, one ratchet lever operating brake and emergency electric cut-off, the other foot lever operating without ratchet, as is customary with the ordinary service brake. These foot pedals operate 14x2½ internal expanding brakes on the rear hubs.

The same trouble-proof features are incorporated in the control system which positively assure the correct operation of the car. For instance, the car cannot be reversed until it has been brought to a total stop.

DRIVING SYSTEM

The worm bevel gear axle construction has been so eminently satisfactory, that it has been continued for all 1916 models. This gear construction offers without question the most economical, reliable and efficient drive system for an electric car. It has been found after a year's use of this gear, that the hardest usage has not effected its high efficiency, silence, strength or durability.

Timken tapered roller bearings are used throughout the axles and wheels. The steering is the improved vibrationless lever operating on self-aligning ball bearings.

BATTERY

The battery equipment consists of 40 cells, 11, 13 or 15 plate Exide or Philadelphia, the number of plates furnished, depending on the conditions the car will have to meet relative to mileage. In extremely hilly towns the large capacity batteries are used, assuring exceptional mileage capacity. Non-wash type of jars used. The battery weight is equally distributed, 20 cells rear, 20 cells forward. No batteries are carried directly over the axles. It is evident that batteries placed over the axles are subjected to severe shock, which does not improve the riding and adds greatly to the battery wear.

The position of the batteries in the Chicago electric not only means better battery conditions in general, but permits the use of more flexible springs, as well as prevents the pounding of axles when the car encounters poor pavements. This position of the batteries permits their being carried at an average of fourteen inches or more lower than found in ordinary electric car construction, thus assuring the lowest center of gravity, eliminating top-heaviness, preventing undesirable swaying and insuring the finest riding qualities.

RENTAL BATTERY SYSTEM

In the city of Chicago, the Walker Vehicle Company is the first to offer the purchasers of electric cars the opportunity of adopting the rental battery system, by selling to those who desire this system, all 1916 models at a reduction of \$270 from the new list price and by this policy the purchaser of the electric car can rent complete battery service at a minimum charge per month and need not stand the investment that is necessary when he purchases a battery with the car. Fur-

thermore, the new rental service which is now offered in Chicago by several battery concerns covers the entire maintenance and repair expense incident to the hardest use that batteries can be given.

In other words, the owner of the electric car pays so much per month for the use of the battery regardless of upkeep or maintenance expense and regardless of whether the car is driven fifty or one thousand miles a month. When the mileage of the battery through wear fails to cover requirements, the old battery is replaced by a new one, thus keeping a constantly fresh battery in prime condition for the use of the car at all times.

It is believed that this new system will prove one of the greatest economy factors ever introduced for the use of electric cars and it is hoped that in the near future this system will be possible in all points of the country to users of electric cars.

TIRES

Tire equipment consists of 36x4½ Firestone notch dual tread, cushion tires and where wire wheels are desired, the Rudge-Whitworth are furnished with 34x4½ Goodrich Silvertown cord pneumatics.

Tread on all models—standard 56 inches.

The prices complete show a considerable reduction and are as follows:

PRICES.

	Last Year.	1916
Model 151, 4 passenger, rear drive, enclosed...	\$2,600	\$1,985
Model 153, 4 passenger, rear drive, enclosed....	2,600	1,985
Model 152, 5 passenger, front drive, enclosed...	2,800	2,150
Model 154, 4 passenger, Cabriolet roadster...	2,600	1,985

RENTAL BATTERIES

A battery rental system which is open to all purchasers of Chicago electrics.

It is intended to give all purchasers of new cars the option of buying a Chicago electric with or without battery. To those who desire to buy without batteries, a deduction of \$270 is made. They can procure rental batteries from the K. W. Battery Company, or from the Fashion Auto Station, and if when the purchase is made, the owner designates in what electric garage the car is to be kept, arrangements are made whereby that garage can procure a rental battery.

The battery rental proposition runs as follows: Where an old battery or a battery of any kind is turned in with the car for a new rental battery, the prices are as follows:

11 plate 40 cell battery.....	\$16.00 per month
13 plate 40 cell battery.....	18.72 per month
15 plate 40 cell battery.....	21.60 per month

An additional payment of \$25 is required with the first month's battery rental. Thereafter the regular payments of \$16 per month are made where the 11 plate 40 cell battery is used.

The customer has the right to lay the car off for two months during the year's contract, for which time there will be no charges for the battery after the customer has given the specified number of days' notice that the battery has been taken out. The capacity of the battery in ampere hours will be guaranteed to be kept up at all times when fully charged in such a shape as to deliver eighty per cent of its rated capacity.

The Rental Battery Company will make repairs of all broken jars, terminals or such minor repairs as are necessary from time to time to keep the battery in good operating condition. In other words, the amount

paid per month to the battery company will cover all expenses and will provide the customer with a battery in prime condition at all times. Whenever the battery, through use, fails to give the required mileage, a new battery is put in. The customer agrees to accept the responsibility for the loss of the battery in case of fire, theft or collision.

The Battery Rental Company agrees also that a deduction may be made from the rental if the battery is out of commission for more than twenty-four hours after notification by the owners of the car that the battery is in need of attention.

The customer agrees to have the battery charged regularly and to give it reasonable care as to flushing and charging. The rental battery company has the right to inspect the battery at the customer's garage at a reasonable time and further has a right to remove the battery from the car without notice at any time upon failure of the customer to pay the regular rent.

Regardless of any difference in cost, the rental battery system offers many advantages. After a battery has covered three-fourths or four-fifths of its total life, and would still be able to give considerable service, it oftentimes happens that its mileage capacity has materially decreased and that before the full life of the battery has been consumed, it is necessary to purchase a renewal in order to get the required mileage. With a rental battery, capacity is guaranteed and when it has reached a point that sufficient mileage is not gained, a new battery is put in, thus assuring the user of a rental battery, continued high efficiency at all times.

Furthermore, most owners of electric cars will spend from one to two months out of town per year, at which time their car is laid up. In the case of a rental battery, during this time a deduction is made and for the time their car is out of use their battery cost stops.

The customer is also assured against any mishaps in regard to treatment and care of his battery, through the rental battery system, for the rental company is responsible for keeping the battery in prime condition at all times. In the case of the customer owning his own battery and through mistreatment or inattention its life is impaired or depreciation sets in, he alone is responsible.

While all modern batteries have been vastly improved in respect to washing requirements, it still becomes necessary in a great many cases for a wash job after seven or eight thousand miles have been covered. This entails another expense on the man who owns his own battery, which is eliminated through the rental battery system.

New York dealers can drive their wives to the railroad station or even take them home while using the ordinary dealers' license tag, according to a decision recently made by a New York magistrate. The police had held this to be illegal and had arrested Thomas P. Petterson, a chauffeur, because he drove the vice president of the Hudson Motor Car Company and his wife to Grand Central station in a car carrying a dealer's license. It was the contention of the police that this license could be used only for demonstration trips. The judge held that the trip was occasioned by an official of the company going about the business of selling motor cars and that such use was covered by the license secured.

Electric Vehicle in Laundry Delivery^{*}

Economy and Reliability as Shown By the Operating Cost of the Brunswick Laundry Co's. Fleet

ELECTRIC Vehicles are especially adapted to house to house delivery and other transportation requirements demanding frequent stops. This is reflected by the fact that department stores, bakeries, breweries, laundries, etc., use them on a large scale. In fact the largest transportation delivery fleets in the world are chiefly composed of electric vehicles. It is significant that these fleets are a result of repeated orders extending over a period of 10 to 15 years and are successfully meeting specifications of transportation engineering experts. The following is a table of some of the largest electric fleets:

Ward Baking Co.....	610
Adams Express Co., in	
two cities	326
Jacob Rupert.....	145
George Ehret Brewery..	136
Commonwealth Edison	
Co.	114
New York Edison Co..	130
American Express Co.,	220
Gimbel Brothers.....	119
Carson Pirie & Scott....	67
Marshall Field Co.....	230

One reason why electric vehicles compose such a large percentage of large transportation fleets is that large and successful organizations usually approach their transportation problems from a practical engineering basis. Unfortunately thousands of smaller concerns and individuals buy motor delivery wagons with but a small conception of their suitability for a particular service—the individual often qualifying himself as an expert because, perchance, he drives a car himself and therefore thinks himself capable of judging automobiles and solving transportation problems. If this type of purchaser would submit his delivery problems to a competent, unbiased authority he would often find his choice unsubstantiated. He usually has but a loose and hazy idea of delivery costs and will almost invariably, perhaps to flatter his judgment, considerably underestimate the true cost. The percentage of motor operators who really know the cost of this service is very small.

Many vehicle manufacturers and also the Electric Vehicle Association, while promoting the sale and use of electric vehicles to all applications, are in addition, conducting investigations ascertaining lines of business particularly suited to the electrics. As soon as these applications become thoroughly known, the operating cost and other data are systematically and persistently distributed to users in that class. Thus we see certain lines of business such as department stores, express companies, breweries, bakeries, etc., whose transportation problems have been satisfactorily administered to adopting electric equipment. The influence of these high efficiency transportation fleets is registered on other similar transportation problems, and finally the purchaser of only one or a few motor delivery cars will, by sheer force of example, be compelled to recognize that his delivery problems, though

on a smaller scale, are otherwise not unlike the large fleet operators. When cause and effect and data can cause this recognition, the demand for electric vehicle equipment will increase steadily.

One of the industries that has been under investigation for some time is the laundry business. Our investigations confirmed our opinion that in no other delivery service can the electric be applied to better advantage than in laundry work. Not only are its inherent dependability, simplicity of operation, and cleanliness, features which every laundry delivery service should have, but also its satisfactory performance and economy of operation in a house to house delivery, are points which should appeal strongly to the clear headed business man. Electric vehicle interests are extremely fortunate in having such a successful operator



Eighteen Electrics Compose Fleet Employed by the Brunswick Laundry.

of electrics in the laundry service as Henry Sieminski, proprietor of the Brunswick Laundry of Jersey City. Mr. Sieminski is generally recognized in the laundry trade as being unusually successful, largely because he has continuously employed most advanced methods. His experience with a fleet of 18 electric delivery wagons over a period of three years justifies careful consideration. In an interview with Mr. Sieminski he states that the experience of the Brunswick Laundry with electric delivery wagons has been very successful. In fact he is convinced that the electric is the very best thing for house to house delivery. After three years' experience, during which time he has added to his fleet gradually so that he now operates eighteen electrics, with two more on order, he states that he has had ample opportunity to observe the results of electric delivery service and compare them with other methods of delivery. The company bought its first electric three years ago and it gave such excellent results, that when the time came to enlarge the equipment, it was decided to dispose of all horses and wagons and buy electrics. To have continued with horse-drawn vehicles would have meant an investment of \$18,000 in new stables alone, exclusive of new wagons and more horses. The man who uses horses for delivery always has a score of bills coming in for harness, feed, horse shoeing, veterinary service, blankets, wagon repairs, etc.

The 18 electrics have not only done the work of the forty horses formerly owned, but also take care of unusually heavy increase in business. The company employed three stablemen to take care of the horses as against one mechanic now who not only attends to the mechanical parts of the electrics but looks over the motors in the laundry. The sure road to success in a business of this kind is conservation of energy and utilization of

^{*}By Henry Sieminski, Brunswick Laundry, Jersey City.

by-products—considering the current for charging our electrics as a by-product. As in most large laundries where everything is run by electricity, the company generates its own power. It has found that the amount of water heated during the day is not sufficient for all needs, so it was found necessary to heat water at night for the next day's washing. At the same time the electric vehicles are charged with the current generated for heating the tanks of water. Thus the electricity for charging batteries is a by-product. The distilled water used for nickel-iron batteries is another by-product—the condensed steam from the hot water used for washing. Records of our coal bills for several months show that since heating water and charging cars at night the bills have increased just \$71 per month. The extra hot water offsets the wages of the night mechanic who cares for the electrics. This means that the company operates its entire fleet of 18 electrics for \$71 per month—the cost of the additional coal for generating current. This represents an expenditure of less than \$4 per month for the energy necessary to propel each 1,000-lb. electric delivery wagon. On a 300 day a year basis this figures the very low cost of 16 cents per day per car for current.

As a matter of general interest to the laundry man, by careful managing and by utilizing every possible by-product this company has done \$20,000 worth of business on an average coal bill of \$500. It will also be interesting to the man who must buy his own current, to know that these electrics operated under this plan, at a general average of \$10 a month per car. As the electric delivery wagons averaged 20 miles per day during this period and figuring on 300 working days to the year it will be noted that the cost for current per mile was about 2 cents.

As for repair bills, it is found that they are a negligible quantity in electric vehicle operation. Just \$16 has been paid for repairs on the first electric which has been used constantly for over 3 years, and that was for new chains and sprockets. Comparing this slight expense with the bills for wagon and harness repair, horse shoeing, veterinary service, etc., this company is saving some-

laundry business is worth considerably more than the interest would be on the initial cost. A clean, attractively painted, smooth-running, silent electric is the best advertiser in the world for the laundry business.



The Electric Is Economical for Many Stops.

The batteries used in the electrics are the nickel-iron type and although the manufacturer guarantees them for four years, they usually last about 8 years. Just to prove the longevity of this type of battery, there was purchased at auction a \$1,200 battery which had been used over 4 years for \$279. With a little cleaning and fresh solution, this same battery has been used for 1½ years, and it is good for considerable more use. Tires will last from 1½ to 2 years on an electric. The average life of the tires on the 6 gasoline trucks which we use for very long hauls, is from 3 to 4 months. As some one has said, an electric never wears out. With the present excellent standardization of parts it is possible to always substitute new parts as soon as the old ones wear out. In the event that a manufacturer of electrics discontinues a model or goes out of business it is a simple matter to get repair parts on account of the simplicity of an electric and the fact that most parts are standard. But when a gasoline truck, with its complicated mechanism, is discontinued it is next to impossible to secure some of its parts except at a relatively higher cost. We keep several accessories on hand in case of accident, and an extra motor so that cars are never laid up for any length of time. So far there has been scarcely any occasion to use these parts.

To show how dependable an electric is, customers can always count on deliveries at a certain time each week within 15 minutes of the hour. This is appreciated by the customers because they not only know when to expect fresh laundry, but furthermore, do not have to waste time or be otherwise inconvenienced by waiting. Women always appreciate the immaculate neatness of delivery men and wagons. This is another important feature in laundry work. Any woman would be rather skeptical of the efficiency of a laundry whose men looked like a lot of blacksmiths from the dirt and grime of a gasoline wagon or who had the disagreeable odor of horses and stables about them. These electrics make on an average of 25 miles per day, visiting all the outlying suburban districts. Some of the best drivers deliver as many as 900 bundles per week and make an average of 32 miles per day. At an average of 25 miles per day and a current cost of \$4 per month the current cost per mile is about six-tenths



The Sanitary Laundry Have Cut Their Delivery Costs Fifty Per Cent.

thing over \$600 a month by operating electrics. The initial cost is, of course, comparatively large, yet when the extreme longevity of the electric—10 to 15 years or more—is considered, the cost per year is very low. In addition the advertising value of the electric in the

of a cent. Also on this basis and figuring 900 bundles delivered per week the energy cost of each bundle delivered is about 1/100 of a cent. In other words, the current consumed in delivering 100 bundles costs about one cent. This is reducing economy to well nigh the irreducible minimum.

During the most severe snow storms last winter the electricians made their usual number of trips in the same average time. There is something about the powerful motor of an electric that enables it to plough right through the snow, which no gasoline truck has been able to do as well. Several times gas cars were stalled and had to be towed in. Efficiency is a big factor in any business and the electric delivery wagon is a mighty big asset in any business where delivery plays such an important part.

The utter simplicity of operating an electric is another big thing in its favor. The same men who had been driving horses and had probably never touched the steering wheel of any automobile before, learned to operate these electricians in a little more than a day.

The safety element is another good thing about an electric. Collisions are very rare things and although geared to run at a maximum speed of 15 miles an hour, 10 miles an hour is a sufficient speed for any heavy vehicle running through city streets.

For laundry delivery service the electric is the most efficient and economic vehicle.

Plans Announced for E. V. A. Convention at Cleveland

Plans for the forthcoming sixth annual convention of the Electric Vehicle Association of America, scheduled for Monday and Tuesday, October 18 and 19, are rapidly progressing. A partial, tentative program which will be amplified from time to time is announced as follows:

"Industrial Trucks in the Service of the Pennsylvania Railway Company," by T. V. Buckwolder, Pennsylvania Railway Company.

"The Electric Taxicab," by I. S. Scrimger, secretary and general manager, Detroit Taxicab & Transfer Co.

"The Hartford Electric Company's Experience with the Battery Maintenance and Battery Exchange System," by Samuel Ferguson, vice-president, Hartford Electric Light Company.

"The Function of the Electric Garage," by R. Macrae, of the Commonwealth Edison Company.

"Comparative Development of General Power and Commercial Electric Vehicle Loads and Function of Power Salesmen as Electric Vehicle Solicitors," by H. H. Holding, general car representative and S. G. Thompson, general electric vehicle representative, Public Service Corporation of New Jersey.

"Problems We Are Facing and How They May Be Met," by George H. Kelley, secretary, Baker Rauch & Lang Company, and president, Electric Automobile Manufacturers' Association.

"Field for the Small Electric Delivery Vehicle," by Charles A. Ward, secretary and treasurer Ward Motor Vehicle Company.

"Electric Vehicles in Municipal Service," by Arthur J. Slade, Consulting Engineer for New York City.

In recognition of the great and growing drain on business organizations of the "convention habit," the Electric Vehicle Association of America has decided to reduce its forthcoming convention at Cleveland to

the lowest possible terms, so that executives and other busy men having important interests at stake can gather its benefits with a minimum expenditure of time. To this end, the sessions at the Hotel Statler, which has been selected as the headquarters of the meeting, will be run on efficiency lines, and supplementary entertainments, such as form a conspicuous part of so many society gatherings, will be subordinated to business.

Electricians for Freight Transfer

For a number of years, the terminal managers of the New York, New Haven & Hartford Railroad at Boston, have been struggling with the question of how best to handle "transfer," or through freight coming to that terminal from many nearby stations, there to be moved from its inbound houses to its outbound houses for loading to destination. During the past, considerable experimenting has been done with gasoline and electric trucks, and as a result, the railroad company has installed two electric trucks of 5-ton capacity to be used in this work. After nearly two years' experience with electricians, the railroad company is in a position to give some very interesting information on their economic and efficient operation of the electric trucks.

Previous to the installation of these trucks, they were using about thirty-seven freight cars for shifting at a per day expense of 45 cents each, or a total daily expenditure of \$16.65. The company now uses only one of these "shifters."

Under the present method, each electric truck carries approximately 35 tons per day, going between houses that are from 1/4 to 3/4 of a mile apart and making an average of 12 miles per day. Under this plan, a great deal of delay to the freight is saved and a considerable amount of operating expense. So far, the mechanical upkeep of the electricians has amounted to less than \$1 per month, the company garaging and caring for the electricians themselves.

Each truck has a driver, who is also a checker, the freight being handled by men at various freight houses. Each one has a clear loading space of 6x15 feet with stakes, side opening, high seat and three bow hoods. With the above loading space, on their mixed freight hauls, they carry from 9,200 to 10,000 lbs. conveniently.

Woods Electric Announces "16" Series

The Woods Motor Vehicles Company, Chicago, announces a new line of electricians consisting of three five-passenger models and one four-passenger model. The four-passenger model is a rear drive. Rear, front or dual control are obtained on all five-passenger models.

The Woods spring suspension, with radius rod mounting and solid rubber tires, has been still further improved on the latest models.

With the exception of Freeport, Illinois, cities have refused to apply for automobile licenses for motor apparatus used in their fire and police departments. They declare that the motors are public property and that it is illegal to tax them as private cars are taxed. The state has so far made no effort to enforce the license law where they are concerned.

Types of Wire Wheels

Early History and Recent Mechanical Development Making for Resiliency and Greater Mileage

THE wire-spoke wheel, or "wire wheel," as it is commonly termed, has been subject to much discussion in recent years, but to date no complete analysis of the wire-wheel situation has been put forward.

In the early days of the automobile in this country, wire wheels were used, and, as we all know, were not a success. Spokes loosened and broke and the wire wheel was discarded as being unfitted for use on automobiles and was replaced by the present type of artillery wood wheel. The wire wheels used at that time were exact duplicates of the bicycle wheel, except that heavier rims, spokes and hubs were employed, having spokes strung in two diverging planes from the front and rear of the rim to the front and rear of the hub respectively.

If we stop to analyze the wheel outlined above, applied to a bicycle, we find the load carried directly over the center of suspension of the wheel, and there was no possibility of the wheel receiving any side strain whatever. The center of gravity of the wheel and rider

The next step in the development of a lacing for automobile wheels was the production of a wheel, laced in three planes, spokes running from the front of rim to front of hub, front of rim to rear of hub, and rear of rim to rear of hub. The side bracing effect of this method of lacing produces a wheel much stronger laterally than either of the foregoing types and is in common use today.

In this type of wheel the ideal bracing of a wire wheel has not been reached, inasmuch as the inside row of spokes of the wheel are so nearly vertical they can take very little side strain. This means that the wheel is not as strong laterally as it would be if all spokes could take side strain.

Considering the different loads which can be applied to the wheel, assuming that each spoke has a tensile strength of 3,000 pounds (as is the usual practice), each wheel having sixty spokes, one-fourth of the spokes can take vertical load or $15 \times 3,000$ pounds, which is 45,000 pounds, figuring ultimate strength. Driving or braking load can be taken on one-half the spokes (tangential stringing) or $30 \times 3,000$ pounds, which is 90,000 pounds ultimate.

From the above it will be seen that the wheel is tremendously strong for vertical, driving or braking load, and we must therefore design our wheel to give the greatest possible strength laterally; in other words, all spokes must be able to take side strain.

The latest developed wire wheel has spokes in four planes, so designed that every spoke in the wheel can and does take its share of side strain, producing a wire wheel in which all strains are balanced, bringing the wire wheel to its highest efficiency as to correct method of lacing. This particular rim and wheel construction is covered by patents or patents pending. The method of lacing is as follows:

Front of rim to front of hub; front of rim to rear of hub; rear of rim to rear of hub and rear of rim to front of hub, forming a lacing, braced in all directions, in which all strains are balanced. In order to illustrate clearly the above points in the four different types of wheels mentioned, the following diagram from the *Light Car Age* shows the application of the same number of spokes to produce different strength of structure:

Figure 1 shows the original form of lacing as applied to automobiles.

Figure 2 shows the cross bracing which followed later.

Figure 3 shows the partially braced construction.

Figure 4 shows General Rim Company lacing, braced correctly.

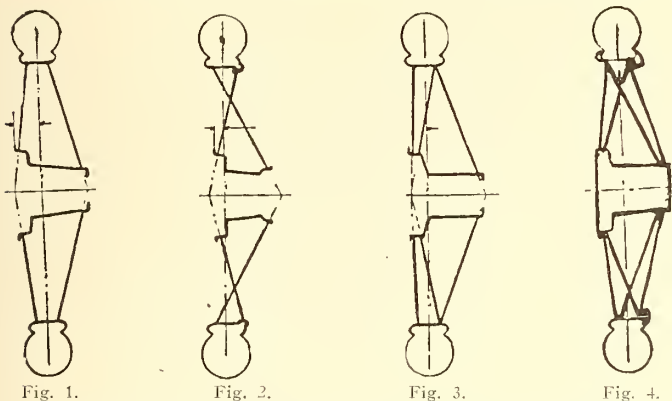
Considering wheels of the four types, each with the same number of spokes, laced as shown in the four different figures, we find the following:

All four types will carry the same vertical load.

All four types will carry the same driving load.

All four types will carry the same braking load.

Wheel shown in Figure 4 is the only one in which the full value of each spoke can be utilized to resist side strain, and in which side strain is balanced.



being high, curves could not be rounded at high speed, consequently there was no side strain developed on either wheel.

When wire wheels were first applied to an automobile no attention was given to the fact that an automobile, stable on its four points of support, could round curves at high speed and remain stable, with the result that terrible side strains were set up in the wheels, which, not being built to resist side strain, failed hopelessly, due entirely to the wrong application of that type of wheel.

This type of wheel applied to motorcycles demonstrates that a suspension wheel carrying the load directly over the center of the wheel is capable of withstanding the most severe usage as failure of wire wheels of motorcycles is practically unknown except in case of accident.

After a period of several years the second step in wire-wheel design was taken, employing spokes in two diverging planes, with these planes crossing between rim and hub, spokes being strung from the front of rim to rear of hub and rear of rim to front of hub. This method of lacing gives more divergence to spoke planes and is naturally a stronger construction, but unless rim is heavier and stiffer than commonly used, the experience with this wheel is much the same as the earlier type of construction.

Referring to the physical properties of wire wheels, much has been said concerning the resilience of wire wheels in comparison with wood wheels. A wooden wheel is built entirely in compression, due to the fact that it is assembled as a unit and drawn into shape and held there by the application of a steel band shrunk into position to hold the wheel together. Any load placed on a wooden wheel is carried by the spokes below the center of the wheel to the hub and in a direct line from the point of contact with the road to the center of the wheel.

A wire wheel is built with the spokes in tension, and the rim in compression, the whole being held together as a unit by the tension on the spokes. Any load carried on a wire wheel is carried by spokes above the center of the wheel, which adds to the initial tension due to stringing. Considering a wooden wheel in service, fitted complete with tire, every time the wheel drops into a rut or strikes an obstacle in the road, the shock is transmitted directly to the hub of the wheel through the spokes below the center of the wheel, causing a blow at that point, and realizing fully for every action there must be an equal and opposite reaction, this blow is returned directly to the tire at the point of contact, which has its effect on the tire.

Considering a wire wheel under the same conditions, the shock cannot reach the hub until it has passed through the rim below the center of the wheel and must be further transmitted through the spokes above the center of the wheel before it can reach the hub.

Buffing through any solid material absorbs shock, consequently the shock received at the center of the wire wheel is much reduced. The reaction—much reduced—has to pass through the same path before reaching the point of contact, with the result that the shock is partially absorbed in the wheel itself and the reaction at the point of contact with the road is materially reduced.

In other words, the wire wheel is a shock absorber, placed at the very lowest point in the car, also benefiting the tires. If we take up the strains in connection with the stringing of a wire wheel, we find that spokes given too high initial tension will become loose in service, due to the stretching of the spoke.

This proves conclusively that the spokes will give under load, and that it is necessary to keep the tension well below the elastic limit in the stringing of the wheel, which also shows conclusively that there is resilience in a wheel of this kind.

Increased tire mileage is a certainty on wire wheels, not only from resilience and reducing the pound on tires due to the reaction from the wheels and unsprung weight, but from the radiation of heat due to all metal contact with the tire, the spokes and rim acting as radiating surface.

This last statement is borne out by the fact that the mileage of tires on the Indianapolis Speedway has been much greater and tire trouble decidedly reduced since the adoption there of wire wheels for racing purposes. The 500-mile race is a terrific grind on tires, which generates heat within the casing, and which causes it to weaken and fail if the heat is not removed, and if it were not carried off by the wire wheel the results would be the same as in wood wheel practice in earlier days. These races show conclusively that the wire wheel is a stronger wheel than the wood wheel, and that increased tire mileage on them is a reality, obtained at a maximum of economy.

Expansion of Electrics in Boston

Electric storage-battery trucks, replacing trolley mail cars, have been adopted by the United States government for the handling of mail in the postal district of Boston, Mass. The new vehicles begin service August 15.

The Boston Mail Delivery Company, with a capital of \$50,000, has been organized by the same parties who have the contract for handling the mails in the New York district. There will be 13 mail trucks, of General Vehicle Company manufacture, each of 1.5-ton rating. Ten trucks are for delivery only, and two for collecting the sacks from postal stations and delivering them to the general postoffice. The former will be manned by a chauffeur only, and the latter will have a mail clerk in addition to the chauffeur. Each of the Boston Elevated Company's mail cars run hitherto, has carried a conductor, motorman and clerk.

The sacks had to be taken from the loading platforms in the postoffice basement in horse-drawn wagons, which entered the building by a ramp from the street at either side, and then transferred to the cars, which stood in the center of the street. This double handling of the sacks is now obviated, the electric trucks entering the building and loading and discharging at the basement platforms.

Some of the suburban mail service now handled on the railroads will be performed by the new trucks. Mails "worked" at the north and south terminals will be handled by truck from those points, but sacks directed to the general postoffice, arriving by train, will continue to be hauled by wagon.

The longest run to be made on any route is 23.5 miles; the next longest, 18.5 miles. These runs cover a circuit of the suburbs and include stops at several sub-postoffices. The cars will be run during the day and well into the night, and some extra trips will be made on Sundays.

Garaging and care of the trucks will be performed at the Boston Edison Company's Atlantic avenue electric garage, where interchangeable storage batteries will be kept charged, to be immediately substituted for spent batteries when the trucks come in from their runs. This service will be performed under the plan lately inaugurated by the General Vehicle Company, the Electric Storage Battery Company of Philadelphia and the Boston Edison Company, by which General Vehicle trucks are supplied with charged battery service on a mileage basis.

The battery equipment consists of 44-cells, 15-plate Ironclad, and there will be 15 batteries for use of the cars. With the addition of two more trucks soon, other battery units may be added. Present charging facilities, which include 18 stations, are sufficient for present requirements, but with the growth of the electric-vehicle mileage-selling plan, the Edison Company may adopt a method of handling the batteries by means of an elevator which will bring up the units from a basement to position beneath the car, such as is in operation at the Hertford Street Garage in London; or else provide roller runways to transport the batteries from the charging positions to a point alongside the trucks, whence the trays are rolled into place horizontally. At present, however, the batteries are moved on a hand truck.

ELECTRIC VEHICLES

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REMITTANCES—Remittances should be made by check, New York draft or money order, in favor of ELECTRIC VEHICLES. Foreign subscriptions may be remitted direct by International Postal Money Order.

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This publication is free and independent of all business or house connections or control. No manufacturer or supply dealer, or their stockholders or representatives, have any financial interest in ELECTRIC VEHICLES or any voice in its management or policy.

CHICAGO, SEPTEMBER, 1915

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WHAT THE WAR MEANS TO THE INDUSTRY

PRACTICALLY every manufacturer in the United States finds the European war an important factor in his sales production. Manufacturers of gasoline automobiles are working both day and night shifts in order to fill orders for thousands of vehicles to be supplied to the allied nations. In the electric car industry the great conflict introduces a new source of sales likewise. Although the warring nations do not employ the battery propelled car in actual warfare, nevertheless the great demands for gasoline vehicles retard delivery for would-be purchasers in United States to such an extent that many seize the opportunity for immediate delivery of electrics. The entire motor truck world has profited and will profit to a great extent in the next year to come. This is especially evidenced by the fact that over seventy million dollars worth of horses and mules have been shipped to the countries at war within the last twelve months. It is assumed that in the next twelve months at least forty million more horses and mules will be shipped from this country.

Accordingly good horses will increase from one hundred to two hundred per cent in price in the next six months. This means that where the small merchant used horse equipment because of the comparatively small initial price, at the present time the high cost of horses and mules and the greatly reduced price of motor trucks will put the question of initial price on a more equal basis. Thus we will find that even the small user with but a limited investment will be able to purchase and employ a motor vehicle rather than horses and mules. The effect of the war is fast eliminating the use of horses, which brings a much greater benefit to electric vehicle manufacturers than it does to gasoline car manufacturers, because the electric is acknowledged as superior for short trips demanding many stops and can compete much more successfully with a horse as far as economy goes than the gas car possibly could. It is but natural then to assume that the electric vehicle industry, especially in the commercial division, will find a great boom in sales. Although this increase in sales will be limited purely to the United States, it is even more encouraging so when we consider that it will have its best opportunity to make good in a country where charging facilities are at a maximum of efficiency. Electric vehicle manufacturers should seize the opportunity to put before the heretofore buyer of horses the fact that the electric is more reliable, more economical and of longer life than the horse, which at the present time is fast becoming an expensive method of transportation.

THE NECESSITY OF A DEMONSTRATOR

VERY few of the automobiles in use in the United States were sold from a catalog. The average buyer, especially in this day of careful purchasing, chooses his vehicle only after a thorough inspection of its exterior and interior appearance, its mechanical construction, its riding qualities, its speed, its luxurious trimmings and those features which can only be appreciated by examining the vehicle itself. It is, then, quite necessary that a dealer or his representative be supplied with an actual demonstrator properly to exhibit his product to the prospective purchaser. Especially is this true where competition is keen and it is a case of securing the probable buyer and closing a sale before competitors have had an opportunity to demonstrate their models. In the electric vehicle industry, even in our large cities, dealers as a rule have but few demonstrators. In fact, some of our most

prominent large city representatives entertain a policy which demands that the salesman purchase his own demonstrator or employ the company's vehicle, which as a rule rarely numbers more than two in each city branch. This means that where from six to ten salesmen are employed, the demonstrator is on the street practically all of the time. In many instances one prospective purchaser will demand demonstration lasting for several hours and others for an entire day. Consequently many salesmen make appointments for a demonstration and are obliged to cancel such appointments because of the fact that the demonstrator has not returned in time to be employed in a following demonstration. Continual cancellation of appointments soon loses the favor of the probable buyer and competition has ample opportunity.

Electric car manufacturers should use every means to supply dealers and branch agents with enough vehicles so that they may at all times have a vehicle on hand to allow demonstration for any period of time necessary in fully satisfying the probable purchaser's demands for examination and proof of ability.

THE 1916 CONVENTION.

PROBABLY the last reminder of the close of a year's effort is the announcement of the industry's next annual convention. In the electric vehicle industry the sixth annual convention is to be held in October, this year at Cleveland, Monday and Tuesday, October 18 and 19.

In previous years the annual convention has attracted electric vehicle enthusiasts from all parts of the United States. This year it is expected that with the place of meeting so centrally located and with the association so well organized, practically every member, some 1,065 in all, will be present to obtain an insight into the industry's previous developments and a clear understanding of what it will offer its followers for 1916.

From a business standpoint the annual get-together means more than a few days of rest well seasoned by banquets, dutch lunches and a general good time.

It represents the only possible opportunity for the various factors in the industry to shake hands with their competitors; compare methods of manufacture and sale; listen to heated discussions on problems confronting all of us; and principally to learn of those channels which exist because of association effort, which make possible a greater and more stable industry.

This year's convention will mean much to those attending.

To the manufacturer it will prove that the central station has developed the progressive habit of "boosting the electric."

To the accessory manufacturer it will evidence a prosperity in the field that means a really greater opportunity for sales in the coming year.

Every manufacturer, dealer and salesman will draw a big dividend on their investment in a visit to the annual meeting. There are new things to be learned which can not be secured elsewhere.

Operating data and suggestions of any nature are welcome to the committees of the next convention and should be presented now in order that the best possible plans may be prepared in making this year's meeting the greatest that has been held in the history of the association.

BUILD A TRUCK

EVERY manufacturer of passenger electric automobiles should build and market a commercial vehicle, because the electric truck is the logical type to introduce into new territory through the local operating power company. Once the manufacturer's electric trucks are installed, the power company, the vehicle owners and the general public soon begin to reveal an interest in the type in general. If the trucks are working successfully—as they will—the local power company has ample opportunity to make further recommendations, until the final outcome of the campaign is a thriving little electric truck using center. The truck manufacturer's name becomes well known and conditions are ready to introduce the passenger car models. The utility of the electric as a satisfactory method of transportation having been established and the manufacturer's product well matured with publicity, circumstances make the entry of the passenger electric most favorable. Those owners of electric commercial vehicles soon adopt the passenger type for pleasure purposes. Their friends and business relations soon investigate the new silent and economical electric. The central station company becomes enthusiastic enough to install proper charging facilities, advertise the electric, both types, and recommend it to its customers. Sales increase and finally from a practically unheard of territory, a "wide awake" dealer builds up a thriving clientele. The manufacturer has extended his field of sales, possible only by demonstrating at a small expense the advantages and utility of the electric as evidenced by the commercial type.

Adjacent to our cities statistics will show that there are many smaller centers where practically every electric sold is of one type of manufacture. On further investigation it will be found that the evolution of these sales had their source in the installation of an electric truck. Three of our greatest electric automobile manufacturers at the present time are forgetting the value of the commercial type. It is the first step in development and if the industry wishes to extend on a large scale beyond the boulevard districts of the large cities, every possible method and sales plan should be utilized.

AMERICAN EXPRESS ADDS 35 ELECTRICS

The American Express Co. will motorize its delivery and collection service in Cleveland. The company has ordered thirty-five electric trucks and these are being built by the Baker R. & L. Company. They will be delivered about October 1. For a short time the two money wagons will be horse drawn.

When the new trucks are delivered the company will have about sixty motor trucks. It now has sufficient gasoline trucks to deliver beyond the three-mile limit. The electrics will be used inside that radius. The seventy horses in use here will be transferred to other cities.

To accommodate its new equipment the company is erecting a fireproof garage at Lakeside avenue N. E. and E. 17th street to cost \$90,000. This will be one story high and will contain a mezzanine floor in which will be quarters for chauffeurs. It will have a repair shop and pit and will accommodate ninety trucks. The gasoline trucks will be in a separate room from the electric machines.



General Vehicle Electric Trucks Feature Prominently in U. S. Mail Delivery Service.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

FOLLOWING is a review of the Electric Vehicle Association activities since the last report in the August issue, as prepared by A. Jackson Marshall, secretary.

Inasmuch as most of the association's sixteen sections suspended meetings during the summer months, it is impossible to give any extended review of this phase of association activities in this report. While the sections, as a whole, do not hold meetings in the summer, it does not necessarily follow that there is not considerable section activity especially through local committees. The sections will, for the most part, begin their fall season within the next few weeks and we can then look forward to further interesting reports of practical section accomplishments.

SECTION ACTIVITIES.

Chicago Section:—The Chicago Section held an executive committee meeting on July 23 in Marshall Field's Annex, Chairman W. J. McDowell presiding.

D. M. Simpson, chairman of the papers and program committee reported that the annual outing was to take place on July 29, at Cedar Lake, Indiana.

D. C. Arlington, chairman of the traffic committee, was not present and no report was read. However, much discussion resulted concerning the booklet, "Some Traffic Suggestions," which had just been issued by the Chicago section. Mr. Arlington, through the mail of the Philadelphia Storage Battery Company, was going to distribute about 3,000 of these, one to each owner of an electric passenger or commercial vehicle, according to his mailing list. The secretary is distributing as fast as possible to the different electric public garages sufficient numbers so that they may place one in each car or may enclose them in their statements.

The report of the Chicago section to the coming annual convention was discussed and it was decided to have the secretary send a letter asking the various local committee chairmen for a report of their activities, etc., of the present year's work.

The formation of a nominating committee was taken up by the chairman and the personnel available was discussed. The chairman stated that he would

not name this committee until some later date. It was decided to have the annual meeting October 5 at noon and hold it as a regular Tuesday meeting of the Chicago section. It was also decided to hold the first meeting after the present vacation period on September 7, which is the first Tuesday in September, the meetings, of course, to be resumed at the same location, namely, the Metropole Hotel, 2300 Michigan avenue.

The general office of the association desires to express publicly in this manner its very great appreciation for the very practical work of great value which the Chicago section is accomplishing in the matter of its so-called parking system whereby users of electric vehicles may leave their vehicles at the Electric Shop of the Commonwealth Edison Company where uniformed, licensed chauffeurs take them to the park and return them whenever ordered. This co-operative service has done as much as, if not more than any one single thing to emphasize the practical value of a local section of the association because the service, much desired, is being extended under the auspices of the Chicago section. It is expected that other cities, and especially those cities in which the association has its 16 sections, where city ordinances deny the privilege of cars standing stationary for any length of time at the curb in the city streets, will develop some such scheme as being successfully carried out in Chicago.

F. E. McCall, secretary of the Chicago section, of the Commonwealth Edison Company, 120 West Adams street, Chicago, Ill., is preparing a detailed outline of the methods employed in the extension of this service and same will be released by the general office of the association to all other section secretaries. In the meantime, it is felt that Mr. McCall would gladly satisfy any request for information in this work.

San Francisco Section:—The following notice was issued to San Francisco section members on August 2 by A. Morbio, secretary:

To Members and Interested Parties:

At the Engineers' Club, 61 Post street, on Thursday evening, August 5, at 8 p. m., we will present the following:

Forty-six publications by the Electric Vehicle Association of America will be exhibited.

Twelve articles on current events, including the European war, will describe what the electric vehicle is doing right now.

In detail, we will tell you, just exactly what the association has to offer.

All of the above will be submitted for your careful consideration; we know you will be interested.

Secretary Morbio had been supplied by Secretary Marshall with a copy of 46 publications which the association had developed from time to time in the last few years, also copies of 12 articles which had been prepared and released by the general office to the press during the last few months. These were presented as tangible evidences of some of the activities of the association in order that the San Francisco members might see in detail what was being accomplished. At the request of Secretary Morbio, General Secretary Marshall wrote about a five thousand word article in the form of a letter, outlining in a general way the scope and activities of the association, which furnished the paper of the meeting.

Owing to the summer and vacation period, the meeting was attended by only 14 members, but it is expected that the next and succeeding meetings will have a very much larger attendance.

MEMBERSHIP COMMITTEE.

There are in the general office of the association 21 membership applications awaiting the approval of the council, two being active central stations and 19 associates.

1915 CONVENTION.

The plans for the sixth annual convention which will be held in the Hotel Statler, Cleveland, Monday and Tuesday, October 18 and 19, are rapidly nearing completion. There was held in Cleveland on Thursday, August 19, a meeting which was attended by Messrs. M. E. Turner, T. P. Cagwin, J. P. Lyons, representing M. R. Berry, H. N. Sibbald, M. H. Moffett, R. S. Dunning, secretary of the Cleveland section, G. E. Miller, and A. Jackson Marshall.

CONVENTION COMMITTEES.

General Convention Committee—Samuel Scovil, chairman; Mathias Turner, Secretary; R. P. Anthony, Edward S. Babcox, M. R. Berry, T. P. Cagwin, Fred H. Caley, N. H. Boynton, R. S. Dunning, Hayden Eames, J. W. Frazer, H. B. Gay, H. S. Green, W. J. Hanley, George H. Jones, George H. Kelly, S. A. Leonard, James F. Lincoln, A. Jackson Marshall, G. E. Miller, M. H. Moffett, F. L. Morgan, Homer Niesz, S. V. Norton, James P. A. O'Connor, W. G. Rose, H. P. Secrest, H. N. Sibbald, M. S. Towson.

Transportation Committee—H. N. Sibbald, chairman; H. B. Gay, A. J. Mitchell, W. H. Link, George H. Watson.

Entertainment Committee—G. E. Miller, chairman; Fred H. Caley, R. S. Dunning, James P. A. O'Connor.

Finance Committee—M. H. Moffett, chairman; N. H. Boynton, George H. Kelly.

Publicity Committee—T. P. Cagwin, chairman; E. L. Colgrove, B. Dyer, A. C. Faeh, W. G. Rose, Harry Smith.

Registration and Publicity Committee—A. Jackson Marshall, chairman, general office.

Papers Committee—George H. Jones, chairman; W. J. McDowell, W. H. Onken, Jr., S. G. Thompson.

TRANSPORTATION COMMITTEE.

H. N. Sibbald, chairman of the transportation committee, is planning desirable transportation for convention delegates. Mr. Sibbald who may be addressed, National Lamp Works of the General Electric Company, Nela Park, Cleveland, Ohio, is very desirous of hearing from all those who are likely to attend the convention as there is a possibility that special trains might be secured from New York, Chicago, St. Louis, and other points. Such facilities are not definitely promised, being contingent upon a required number of

people traveling to Cleveland from any one or more points along the lines that a special train would travel. The special trains would add immeasurably to the comfort and convenience of convention delegates, besides affording means of social intercourse. Furthermore, they would assist in advertising the convention and electric vehicles generally. All those who would be interested in such service are respectfully urged to communicate with Mr. Sibbald.

ENTERTAINMENT COMMITTEE.

G. E. Miller, chairman of the entertainment committee, reports progress. The entertainment program is as yet not complete and further announcements in this respect will be made later. In connection with the entertainment, it might be interesting to state at this point that in recognition of the great and growing drain on business organizations of the "convention habit," the association has decided to reduce its forthcoming convention at Cleveland to the lowest possible terms so that executives and other busy men having important interests at stake can gather its benefits with a minimum expenditure of time. To this end, the sessions will be run on efficiency lines and supplementary entertainments, such as form a conspicuous part of so many society gatherings, will be subordinated to business. The transportation and entertainment committees contemplate providing transportation and guides for those delegates remaining over to Wednesday after the convention, which officially closes Tuesday night, so that they may visit the manufacturers' plants, showrooms, and points of interest in Cleveland. It is thought that a number of the attending delegates might want this opportunity and it is expected that their desires in this matter will be satisfied in an informal way at the close of the convention. Further details later.

FINANCE COMMITTEE.

M. H. Moffett, chairman of the finance committee, reported satisfactory progress in his important committee's work.

PUBLICITY COMMITTEE.

T. P. Cagwin, chairman of the publicity committee, reported that his committee had been receiving convention publicity from the general office of the association and was preparing a campaign with the local papers, the national publicity being taken care of by Secretary Marshall from New York.

EXHIBITION COMMITTEE.

M. R. Berry, chairman of the exhibition committee, reported that there seemed to be a strong demand for an exhibition of electric vehicle batteries, charging apparatus, measuring and registering instruments, tires, accessories, etc., and consequently, tentative plans are under way to hold exceedingly interesting exhibitions at the Hotel Statler, the headquarters of the convention. It is expected that the exhibit will prove one of the most interesting features of the convention, attracting a large number of delegates who otherwise might not attend. It was a little too early to announce details in this development, but a statement will be forthcoming as soon as the exhibition committee have the work fully in hand.

It might be added that an opportunity will also be given the commercial, passenger, and industrial truck and electric wheel chair manufacturers to exhibit if they so desire.

Any concern or individual desiring space for ex-

hibition purposes, should communicate with M. R. Berry, Electric Products Company, 10674 Dupont avenue, Cleveland, Ohio.

PAPERS COMMITTEE.

George H. Jones, chairman of the papers committee, was unable to be present. Secretary Marshall reported for Mr. Jones a tentative and partial program developed to date and appearing elsewhere in this issue.

In addition, there will be reports from sections and association committees and there is excellent reason to believe that the papers program of the sixth annual convention will be a particularly bright spot in the association's history. There are many matters which will come up at the convention which will tend to exercise a very considerable influence on the future of the motor industry.

As has been previously stated, the headquarters for the October 18 and 19 convention will be the Hotel Statler, the room rates of which are \$2 per day upwards for room and bath for one person, and \$3 per day and upwards for room and bath for two persons, suites, parlor, bedroom and bath, \$10 and \$12.

The Hollenden Hotel rates per day with bath are as follows: For one person, \$2 to \$5; for two persons, \$3 to \$6.

The aforementioned rates are based solely on the European plan. The Colonial Hotel has both European and American plans.

HOTEL ACCOMMODATIONS

Mathias Turner, secretary of the general convention committee, of the Cleveland Electric Illuminating Company, or A. Jackson Marshall, secretary of the Electric Vehicle Association of America, 29 West 39th street, New York City, will be pleased to give or secure additional information with reference to hotel accommodations in Cleveland at the time of the convention.

REGISTRATION

In order that each delegate attending the convention may be properly taken care of, the request is made that those contemplating attendance at the convention so advise at their earliest possible convenience the general office of the association in New York, stating the expected time of their arrival at Cleveland and whether they will be accompanied by ladies or other guests.

SALES PROSPECTS

The association is a clearing house for a great number of sales prospects secured not only from different points in the United States, but also practically all foreign countries. When inquiries for electric vehicle information or other sales data is requested, they are satisfied immediately through the medium of letters and literature, and the information contained in these inquiries are placed on what is termed "Common" and "Preferred" prospect sheets and immediately mailed out to all manufacturers of electric vehicles, batteries, tires, accessories, industrial trucks, etc., which organizations supply inquirers with detailed and specific sales data. It is interesting to note as a partial result of the association's extensive publicity campaigns conducted in many of the foreign countries that we are receiving a large number of excellent letters from almost all points in the world, seeking information about electric vehicles, and in many instances, indicating a desire to purchase some type or model.

This is interesting because to many people the Electric Vehicle Association is regarded solely as a national body whereas it is conducting quite an aggressive international campaign which is assisting the manufacturers in selling their commodities abroad. The association has quite a number of foreign members and these are being increased rapidly.

Boston Brewer Has Electric Sign Truck

Haffenreffer & Company, of Boston, use the five-ton G. V. electric truck for its advertising their stock ale. The truck is nothing but an animated electric sign and has created a great deal of attention not only among Boston merchants but among central station men and the merchants of other cities.

They first bought a five-ton chassis equipped with Edison A-12 battery. The cab and body were built in Boston. The total cost of the truck as illustrated was about \$6,400. The advertising body can be discarded at any time and the regular brewery truck body substituted.

The frame work of the body is structural iron, and flat work galvanized iron. The signs are removable and the body of each sign is vented to let the water drain. The main body color is a handsome shade of green. The running gear is red and the sign background black. The lettering is in gold-leaf. The front sign (over cab) is glass with red background and gold letters. On each side of the body there are sixty-six 55 volt lamps the body being 14 ft., 9 in. long. The rear end has twenty 55 volt lamps and the front end six 55 volt lamps.

All lamps have pear-shaped reflectors. All lamps have screen protection, $\frac{1}{4}$ inch mesh net, except front sign. Lettering sides and rear end of sheet iron, raised. Front sign, covered with glass. Other signs exposed. Back of driver's seat Cutler Hammer resistance 84 volt, 36 ampere. Cutler Hammer resistance has knife switch so that illuminated signs may be turned off. Ampere and volt meter on dash.

Electric illuminated trucks for advertising purposes will, in the opinion of many electrical men, soon come into general use. The Haffenreffer truck is very unique, however, in that the advertising body is practically interchangeable with the working body of the truck.

St. Louis Rules Horses Off Streets

Horses are to be chased off the streets in St. Louis to make way for the motor car. After a detailed investigation of traffic conditions on Locust street, one of the main thoroughfares of St. Louis, and on which almost half the motor car and accessory business of the city is done, the director of streets has recommended to the board of police commissioners that the use of horse-drawn vehicles be prohibited on Locust street west of Eighteenth street.

Maryland Club to Fight Ruling

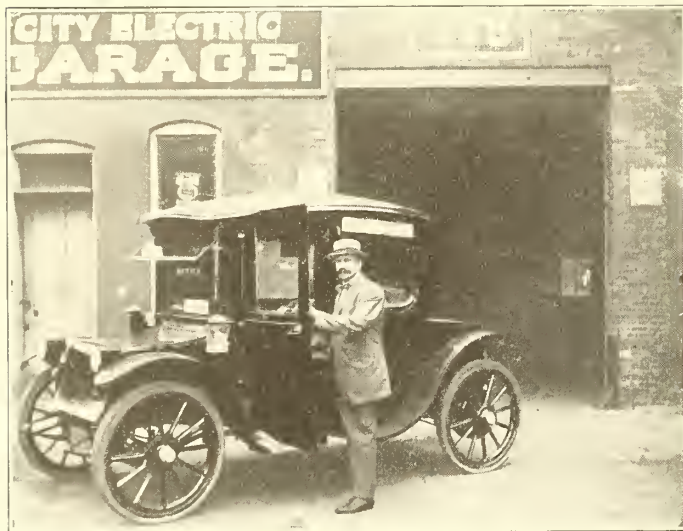
The Automobile Club of Maryland is preparing to fight a ruling which places motor cars under the same ordinance with wagons in that they cannot remain standing on the streets more than two hours at a time. The law will become effective September 15, and the club is trying to nip it in the bud.

Buffalo to New York City in a Waverley

C. S. Chamberlain of the Waverley Electric Sales Agency, Buffalo, completed a trip from his home city to Manhattan in a Waverley electric four-chair-brougham which made a new record for continuous touring in an electric vehicle; 456½ miles in three days.

He left Buffalo at three o'clock Saturday morning, and arrived in New York City on Monday. This meant strenuous work for the electric car and is fully up to the average gas car performance.

Mr. Chamberlain knows his car and also his battery, which was a Gould 42-cell 13 plate lead battery rated at 168 ampere hours, the ordinary battery equipment of Waverley electrics. Although the battery is rated at 168 ampere hours, Mr. Chamberlain says it is good for 190 plus. He ran his car on third speed, which with a Waverley means 15 to 16 miles an hour, and estimated that this will require 25-28 amperes or about two ampere hours per mile.



C. S. Chamberlain and Waverley Finishes 456½ Mile Run.

Here was the schedule:

Left Buffalo at 3 A. M., arrived Batavia at 5.30, 39 miles, 80 amp.-hrs. used. Charged 2 hours putting back 50 amp.-hrs.

Left Batavia at 7.30, arrived Geneva at 12 noon, 67 miles, 140 amp.-hrs. used for total of 170. Charged 5 hours putting in 130 amp.-hrs.

Left Geneva at 5 P. M., arrived Syracuse at 9. 55 miles, 120 amp.-hrs. used which left about 30 amp.-hrs. in the battery. Spent night getting full charge.

Left Syracuse at 2 A. M., arrived Utica at 8.30, 52 miles, 110 amp.-hrs. used. Charged 4½ hrs., putting back 100 amp.-hrs.

Left Utica at 1 P. M., arrived Schenectady at 6.30, 80 miles, 160 amp.-hrs. used. Charged 1 hr. at 30 amp.-hrs.

Left Schenectady at 7.30, arrived Albany at 8.30, 15.5 miles, 35 amp.-hrs. used. Spent the night getting a full charge.

Left Albany 5 A. M., arrived Poughkeepsie at 10, 75 miles, 150 amp.-hrs. used. Charged 5 hours putting back 130 amp.-hrs.

Left Poughkeepsie at 3.00, Yonkers, 60 miles at 7.00, New York (63d St.), 13 miles, 8 P. M., 73 miles, 150 amp.-hrs. used.

There are electric experts who said this schedule was impossible for an electric car to live up to but

Mr. Chamberlain had a good car, the backing of a good company, and the interest and support of the Gould Storage Battery Company, the electric power stations along the route, and of A. Jackson Marshall, secretary of the Electric Vehicle Association of America.

He was entirely confident of his ability to make the trip on schedule time, and says moreover that any owner can do the same thing if he has a good car and a good battery. Mrs. Chamberlain accompanied him on the trip.

The Waverley four-chair-brougham in which the trip was made is a striking and unusual car in its design, seating arrangements and finish. The body is aluminum and a luxurious separate chair is provided for each passenger. The motor is of Waverley design and manufacture of the series-wound type, and the transmission through a parallel shaft drive with herringbone gears to the full floating rear axle. All the details of mechanical and electrical construction show up-to-date engineering and intelligent mastery of technical details.

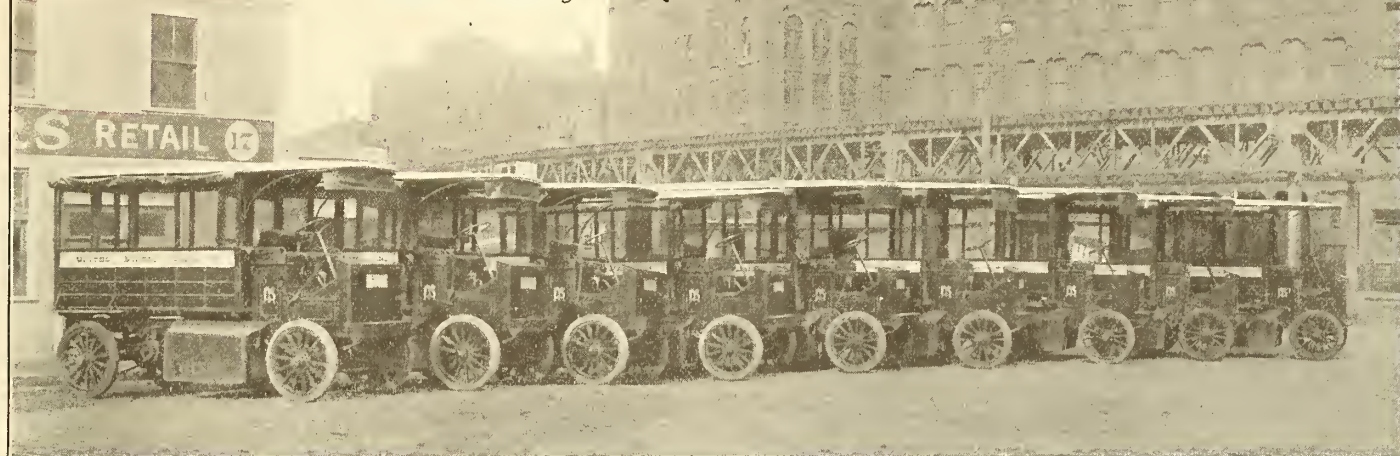
Electrics in Motion Pictures

Some motion picture companies have been missing a good opportunity by not employing a greater number of electrics in motion pictures as the electric vehicle has been such a success whenever employed. Every studio manager has experienced the difficulty of getting the gasoline cars to make a quick get-away at some crucial moment when the dramatic interest is really dependent on the immediate starting of the automobile. Delay in changing gears, stalling the engine, all add to the troubles of the exasperated director. The electric which starts instantly without any gear shifting needs no time to gain momentum and travels continuously without jerk at a satisfactory speed. Owing to its extreme simplicity anyone can run an electric, which obviates the necessity of having a special driver. Although some of the chief actors in the scenes where an automobile is used do the driving themselves, their performance is generally unsatisfactory due to inexperience and nervousness imposed by attempting to portray the character and attend to the car's complicated mechanism at the same time. If a chauffeur is employed it often detracts from the story interest of the picture as there are times when it is desirable for the actor in the interests of the plot to abandon the chauffeur and drive the car himself.

In addition to the immediate starting of the electric and its simplicity, there is the safety element which should appeal to the motion picture operator and this is especially important when operating in congested city traffic or performing some spectacular "stunt" requiring utmost delicacy and positiveness of control. How many needless accidents have there been while taking motion pictures through automobile collisions? And how many thousand feet of film have been needlessly wasted through the improper performance of some part? It takes time and strength to put on the brakes of a gasoline car while with an electric it is merely a matter of turning off the current and the car stops immediately, the brakes acting simply and easily. In any emergency or situation requiring rapidity of action the natural inclination is to attempt to control the car at a sacrifice of the character portrayal. This mental hazard militates against the effect sought for by the director. In other words the electric vehicle provides the actor with a medium best qualified to assist in depicting the character and situation.

Electrics Beyond Comparison for Mail Service

G. V. Electric Battery Trucks Demonstrate Unlimited Endurance



THE first large installation of electric trucks for mail postal service was inaugurated in the spring of 1909 when twenty-two G. V. electrics of 1,000, 2,000, 4,000 and 7,000 pounds per battery were furnished by the Motor Delivery Company of New York, when it took over a horse service which had a contract for the work.

Notwithstanding the fact that the Motor Delivery Company started in on a horse basis so far as the price paid for the work was concerned, it delivered the goods in the matter of schedules and was awarded the next contract in its territory. By August 1, 1912, the company had twenty-eight of these electrics in service, seventeen of 1,000 pounds, five of 2,000, four of 4,000, and two of 7,000 pounds capacity. The aggregate mileage for 304 days ending July 1, 1912, was found to be 336,000 miles annually, or about 12,000 miles for each wagon. The electrics were obliged to maintain schedules involving very close connections, and it was openly stated by employees of the New York post office, that "nothing but an electric could stand that grind."

But mail contracts are competitive, uncertain things. A lower bidder secured the next contract and the faithful electrics were displaced. It is of interest, however, to note that thirteen of the electric wagons were later contracted for and utilized in parcel post work. The photograph of one of these parcel post wagons is shown on our front cover.

Briefly, it may be said that mail contractors in New York City tried to get along without electrics and could not do it. At least, this is indicated in a substantial way by what happened later, for in January, 1914, a contractor who, the writer understands, took over the contract of an unsuccessful operator in addition to his own, purchased from the General Vehicle Company twenty two-ton trucks. These were placed in service early in February, 1914, more or less in competition, so far as performance was concerned, with about eighty gasoline trucks.

And once again, endurance of the electric, under the often twenty-four hour grind of shuttle service, was demonstrated. When on August 15 the motor vehicle service which displaced the street railway mail cars in Boston was inaugurated, it was fifteen one-ton (converted) G. V. electrics which did the trick. These elec-

trics carry the mails between the main post office in Boston and the various branch post offices in the Back Bay, Brookline, Cambridge, Watertown and the Newtons. These electrics, furthermore, will be operated on the battery service system of the General Vehicle Co.

Further evidence of the growing appreciation of the electric postal deliveries is found in still another city. The Postal Transfer Service, Inc., was a successful bidder in St. Louis and will install from twenty-five to thirty motor delivery mail cars in that city, the majority of which will be G. V. electrics.

With electric trucks in successful operation in Washington, Indianapolis and other cities, and the day of the electric mail wagon may be safely said to have arrived, and this decidedly.

Enforcing New Denver Traffic Rules

Three new traffic regulations are being tried out in Denver under ordinances just put into effect, following a recent avalanche of fatal and otherwise serious accidents involving motor cars, other vehicles, street cars and pedestrians.

One prohibits cars from parking on streets in the business section with either of the inside wheels farther than 2 feet from the curb, or the front line of the car closer than 4 feet to the rear line of the car next in front. This restriction applies especially to the business streets having street car lines, where crowded conditions have become a menace to all kinds of traffic.

Another requires headlights on all bicycles and motorcycles while in motion, and rear lights on all carriages and all other kinds of vehicles, whether moving or standing, with the exception of vehicles used for transporting oil or gasoline. These headlights must show a white light visible a distance of 50 feet in the direction of travel, and the rear lights must show a red light visible 20 feet to the rear. All vehicles loaded with materials projecting from the rear must carry the red signal light at the extreme rear point of such projecting materials.

The third establishes marked courses for pedestrians to cross the streets inside the curb line at street intersections, and prohibits crossing an intersection at an angle or crossing a street in the middle of a block.

From the Garageman's Point of View

Lack of Co-operation from Manufacturers Deprives Garagemen of Last Support

WHAT the electric garage man needs at the present time and has needed for some time past, is more co-operation. Instead of harming and knocking him continually, help him when you have an opportunity.

Allow the garage man to furnish the supplies, such as tires, batteries, etc., for the cars he is taking care of. He is the one who is watching the batteries continually to have them give his customers the best possible mileage and service.

Why should the manufacturer have a follow-up system for service—in other words try to get all the repairs on the car and handle the supplies too? If he finds everything on the car in satisfactory condition at the time of his inspection, he writes the car owner that in a month or two the batteries in the car will need washing and solicits the work. The garage man must merely sit back, keep the electric cars running in the best possible way, give the car owners all his attention, give them the very best of garage service, charge them the lowest possible garage fees, and then when he could have an opportunity to make a small profit on the sale of supplies, he must allow the manufacturer to make it instead.

In other words, the garage man is not supported properly.

Further than that, the manufacturer gives the electric car owner an unreasonable mileage guarantee on his batteries—one which he knows he cannot fulfill. Consequently, after a set of batteries have run a just amount of mileage and are worn out, but the car owner still has about 6,000 miles coming to him on his guarantee, quite an argument arises. Naturally, the car owner refuses to do anything and it is up to the manufacturer to put the blame on some one, and, of course, the garage man is the "goat." In other words, he is told that he has burned up the batteries by not giving them correct attention and that the lost mileage is up to him. If he has money he pays the bill. If not, the car owner naturally threatens to pull his car out of the garage and in order to hold the car, the garage man is forced to reduce his garage fees, which, of course, causes more trouble.

That, however, does not end the deal, as on account of the first battery being worn out, it is necessary for the car owner to purchase another set, which he gets from the manufacturer with another unjust mileage guarantee. This, of course, means that the garage man must prepare for another knock.

Is that fair and just treatment for the garage man when he is doing all in his power to help the electric car business? That is only one obstacle with which the garage man has to contend, and a thousand more on the same scale could be mentioned.

The result, unless the garage man is given fairer treatment, will be that the electric car business will be at a standstill and show no future progress whatsoever.

It merely means that unless the garage man is allowed to make a little profit on supplies, etc., he will either have to go out of business or raise the price of car maintenance, which you all know it will be im-

possible for him to do. Under the present conditions he cannot exist.

The success of the greatest automobile man of the day was due to the fact that he gave everybody a chance to make a dollar on his ware.

It seems that manufacturers ought to see that the garage men are their best sales argument and that they ought to encourage them to remain in that business.

I personally have interviewed all the garage men in Chicago, and 95 per cent of them have turned a cold shoulder toward the electric car business, and prefer the gasoline business in its place.

Now, then, what is the trouble? Is it because the electric car manufacturer thinks he has the better hand? I do not think that is the case. I know and no doubt you all do, that almost every electric car manufacturer has had his own garage at some time and given it up as a bad job.

If we had water in the desert, more people would travel across it. Just so, if the garage man would receive more co-operation instead of all knocks, he would be more interested in the electric branch of the business and more cars would be sold.

I am sure that after careful consideration, you will see that the electric garage man deserves just a little better treatment than he has been receiving. There is no reason why the electric garage men should have to stand all the abuse they do and its continuance will simply mean an obstacle in the progress of the electric vehicle business.

As to central stations, I must say that they certainly can be thoroughly relied upon at all times to work hard in assisting the garage men. However, I would suggest to them that they have the peak load charges done away with. This peak falls during the garage man's heaviest season, that is when his customers are using their cars all day for shopping and at night for theater going.

Of course, after having used their cars all day, they are in need of a boost so as to be able to be used in the evening and the car must be charged some time between 4 and 8 p. m. It makes it pretty hard for the electric garage man to have to pay an extra high rate for current consumed at that time, when the car owner must be satisfied.

Doing away with that peak load charge would help the electric garage man materially and would be more than greatly appreciated by them.

An ordinance was passed in Chicago, whereby a car owner was not allowed to leave his car standing in one place in the loop district of the city for a longer period of time than one-half hour. This, of course, made it very difficult for the ladies desiring to use their cars for shopping, etc., and a great many stated that unless something could be done to assist them, they would dispose of their cars.

In order to prevent any such action on the part of the electric car owners, I immediately opened a station in the loop district of the city, where my customers may leave their cars while doing their shopping, with one of our men who will park and take care of it for them during that time and have it ready for their use.

*Fashion Automobile Station.

Anderson Electric in New Price Field

Doubling of Production and a One-Chassis Basis Make Possible a New Era in the Electric Car Industry

BY A sweeping readjustment of its forces along the lines that have made the automobile industry famous among productive activities, the Anderson Electric Car Company, Detroit, has paved the way toward a position of greater prominence than any maker of electric pleasure cars has yet achieved. Most conspicuous among the results is the disclosure of price reductions of nearly 22 to 25 per cent on the entire line of Detroit electrics, which is one of the best known in the field, and which in improved form will range in cost from \$1,975 to \$2,275. To permit the new listing to go into effect, the output is to be doubled, in which connection considerable improvements in manufacture have gone into effect, while the distributive end of the business likewise is undergoing expansion and new dealerships are being placed in territory that has not previously been occupied, because of the price of electrics heretofore.

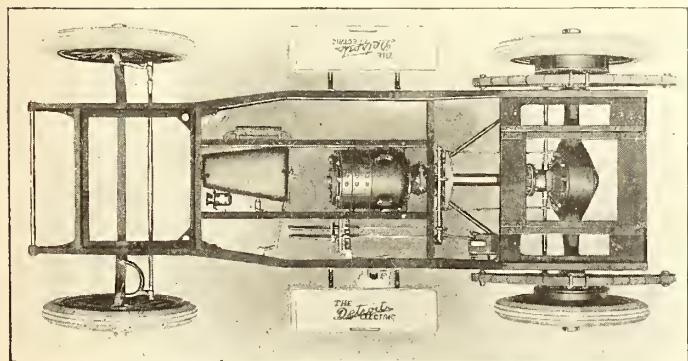
As a means of realizing the expansion of the business, which has been gone about in a very thorough manner, one of the most important steps was the adoption of the one-chassis basis of production. Continuing many of the tried and trustworthy features that have rendered the Detroit cars so successful in preceding models, the design has been so far standardized as to permit four different styles of body to be imposed upon a single chassis. In addition, the factory floor space has been greatly enlarged in order to facilitate and expedite production, while the installation of new and highly advanced automatic machinery has provided for absolute interchangeability of parts. Every operation in metal on the body, for example, is now carried out with mechanical precision. The 1916 battery is of exclusive Detroit electric design and manufacture, and will weigh at least 50 pounds less than formerly, although its capacity is somewhat greater than before. A heat treating department has been added, and in every part where high stresses are anticipated, chrome nickel and chrome vanadium steels are now used.

The complete line now includes six models, the general details of which are as follows:

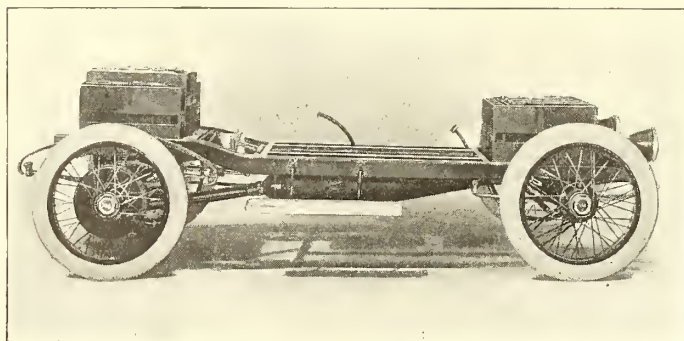
Model "61" is a four-passenger brougham of compact form that is particularly well suited for use about town and in crowded traffic, owing to its easy-handling qualities. Its price is now \$1,975, instead of \$2,600,

as formerly. The broad rear seat accommodates three persons comfortably, while a fourth seat is provided in a revolving Pullman chair in the right front corner of the body. The equipment includes head-lights, sashless side door window lifts operated by turning a knob, body side lamps, two interior lights, tail lamp, Weston voltmeter, Veeder odometer, alarm bell and horn, toilet case, cut glass flower vase, Hanlon patent rain-vision front window and full set of tools. Wire or wood wheels and Goodrich Silvertown cord or Motz tires are optional equipment. The higher capacity battery affords a greater radius of movement than will ordinarily be used in a full day's operation. The operating levers are mounted at the side of the rear seat and are two in number, the longer being the steering lever, while the shorter, which is operated by the left hand, is the controller. When the car is to be left, these levers are lifted up against the side of the car and locked, thus rendering the machine inoperative. Two sets of brakes are employed, either of which may be operated independently. The foot brakes are of the internal expanding type and act on drums in the hubs, 14x2½ inches. The hand brake is of the electric type and operates on the motor. It is applied by a backward movement of the controller lever. The drive is by the increasingly popular spiral bevel type of gear. All portions of the body that are exposed to the weather, such as panels, battery hoods, moldings, fenders, window frames and roof, are of aluminum, and the finish and appearance are such as to place it well up in the scale of vehicles of luxury as well as utility.

Model "60," which formerly sold for an even \$3,000, now sells for \$2,275. It is a five-passenger duplex-drive brougham that exemplifies the highest type of its class. As a matter of convenience solely, two complete sets of controls are provided, one for the front and the other for the back seat. Each set includes the standard arrangement of parallel steering and control levers and the brake pedal, so that the operator may select either of the two driving positions, to suit his convenience and the seating of his party. When one set is in use the other set is automatically locked and the levers folded against the side of the car, so that there is absolutely no danger of unintentional interference. As in the model previously mentioned, double brakes are provided. The wheelbase is



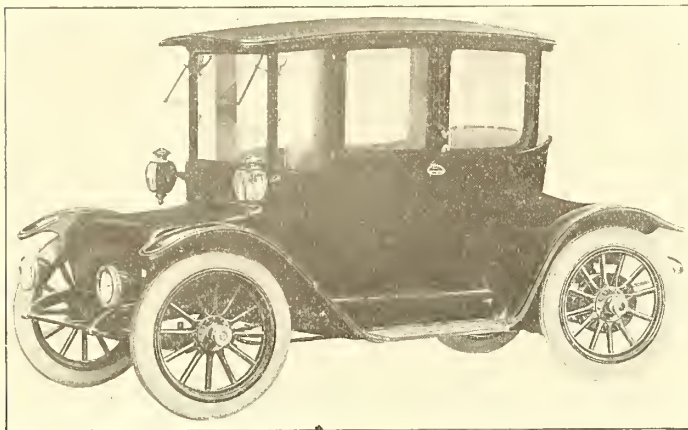
The Chassis Construction Is Complete and Workmanlike.



The Compact Mechanism of the Detroit Electric Chassis.

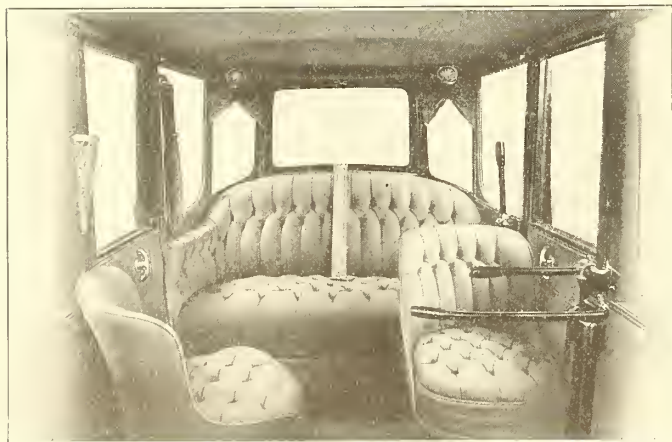
100 inches, and this fact coupled with the easy properties of the long springs renders the car particularly smooth riding.

Model "59," formerly \$2,950, now lists at \$2,225 and is a five-passenger rear-drive brougham. There is



One of the New Detroit Electric Broughams, Model "57." \$2,175.

seating accommodation for three on the rear seat, while a fourth passenger is taken care of by the revolving Pullman chair in the right front corner and the fifth sits on the large upholstered box seat in the left front corner. The foot brakes on the rear hubs are 16x2½ inches and are controlled by the double pedal arrangement that is one of the features of the design. To the left of the main pedal by which the brakes are ordinarily operated, is a smaller pedal, the application of which not only sets the brakes, but cuts off the motive power through the operation of a knife-blade switch and applies a ratchet that retains the brakes in the set position. When the brakes are so set they cannot



The Spacious Seating of Model "59" Rear Drive Brougham.

be released until the controller has been returned to the neutral position.

Model "58" now sells for \$2,250, as against its former price of \$2,950. It is a five-passenger brougham of the front drive type, operated from the Pullman chair in the fore part of the body.

Model "57" is a four-passenger rear-drive brougham selling at \$2,175, instead of \$2,850.

Model "56" is a three-passenger cabriolet listing at \$2,075, as against its former price of \$2,650. It is especially designed for business men's use, and seats two side-by-side and a third on the auxiliary front seat. For fine weather use this is essentially an open

car, but for bad weather the top may be raised and the curtains drawn, affording complete protection. All panels and battery hoods are of sheet aluminum and in finish and equipment the machine is on a par with the other models.

Among the new details incorporated in the 1916 models are a number making for the convenience and comfort of the user that materially improve the product. These include new locks that may be operated from either inside or outside of the doors, improved arm rests, thick rubber channel dovetailed settings for the glass, making the windows absolutely watertight; and sundry mechanical improvements. Among the latter may be mentioned the incorporation of the new-style battery in eight trays of identical construction having all connections outward when the hoods are raised and completely accessible. The battery hold-downs and several other parts are especially treated to prevent the accumulation of rust and corrosion due to acid or water.

For the rear-drive models an improvement has been made in the steering gear whereby the effects of shock and vibration on the driver's arm, as well as on the mechanism, are obviated. In place of the former long reach rod, two shorter rods are used, in connection with an idler bracket, which is spring supported to obviate rattling tendencies. The device is grease-packed, and is so designed that it can readily be withdrawn from under the car for inspection.

Vehicle Tax Reinstated in Illinois

Illinois automobile owners will again have to pay a wheel tax.

Despite the fact that the former wheel tax ordinance was thrown out as illegal by the Illinois supreme court in a test case that affected all Illinois cities having a similar wheel tax law, an ordinance has been passed requiring licenses for vehicles of all kinds.

A modification contained in a bill passed by the last legislature is said to have again legalized the municipal wheel tax.

The tax varies from \$2.50 per year for single horse wagons up to \$10 for motor trucks and automobiles used for hire. It is the same ordinance as in effect in Chicago.

The licenses expired on April 31. When licenses are bought for less time than one year, the price is proportionately lower, excepting that in no case will less than one-fourth of the annual license fee be accepted.

The ordinance specifies that the money obtained from the sale of the license shall be placed in a separate fund to be used only for street and alley improvements.

It is provided that the tag issued by the city clerk shall be placed in conspicuous place on the right hand side of the vehicle. The exception is made in this provision for motor cars, which need not carry the tag. The tag must be carried at all times the vehicle is in use.

The United States supreme court has upheld the Florida law which fixes a license tax of \$3 on each car and then permits additional local taxation. Automobile owners contended that this was double taxation and fought the matter in the courts.

The new Utah law provides for annual registration instead of perpetual. Fees are \$10 for electric pleasure vehicles, \$10 for commercial vehicles.

Electric Garage & Dealers Announce Constitution

New Organization Growing Rapidly, Including Practically Every Chicago Electric Garage Man

THE Electric Garage & Dealers' Association, division of the Chicago Garage Owners' Association, is now a live going organization. The wheels are moving fast toward putting into active operation the policies for which this organization was formed.

It is needless to dwell on the necessity for this organization since we each realize stronger today than ever the imperative need of just such an organization. That every man of weight in the industry has his heart set on this movement cannot be denied. We all know the cause is right and imperative to be fought for, if we are to build up and protect our interests.

No organization could be formed on a foundation that would promote and protect its vital interests better than the basis upon which this association rests. This foundation was built and approved by the men who have the entire electric vehicle interest at heart. The very ends for which each of us are striving are the very ends for which this organization was formed. This movement will be organized on the soundest business basis. It has the pledged support of practically every dealer, garage man and battery manufacturer. It is going to be the liveliest, strongest and most beneficial organization of its kind in the country. No concern or individual in our industry today can have the welfare of the electric vehicle conscientiously at heart and not support this movement with all his strength.

Careful consideration has been given in drafting the association's constitution. The society is a factor which will eventually bind together every electric vehicle interest for the betterment of the industry.

CONSTITUTION

OBJECT

The object for which the association is formed is to promote the electric vehicle industry in all its branches, to establish a firm and friendly relationship among its members, to elevate the standard of efficiency in garaging and caring for electric cars; to standardize and improve the service to be rendered by the electric garages for the bettering of trade conditions and for the close co-operation between the electric garage owners, electric vehicle manufacturer or dealers, battery and tire manufacturers or jobbers and to become a part of a central organization, including all branches of the motor vehicle industry.

MEMBERSHIP

Section 1.—The membership of this association shall consist of individuals actively engaged in either the garaging of electric vehicles, the manufacture, sale or promotion of the use of electric vehicles, the manufacture of electric storage batteries and the manufacture of tires specially adapted to the use of electric vehicles.

Section 2.—Honorary members may be elected by two-thirds vote of the active members present at any regular or special meeting among persons who have rendered distinguished service in connection with this association and the objects for which it was formed, who shall not have the privilege or the power to vote on any question or to hold office.

Section 1 (A).—Application for active membership with the recommendation of one member in good standing accompanied by application fee, shall be made in writing to the secretary, who shall refer same to the membership committee.

(B).—After approval of membership committee, application shall be allowed to stand over thirty days, after which

BY GAIL REED

time in open meeting of the association and upon two-thirds vote, such applicant shall be duly elected member of the association.

Section 2.—Should any member dispose of his place of business and discontinue in the business for which this association was formed, his membership shall thereupon terminate after the expiration of thirty days or he may elect to transfer his membership subject to approval of membership committee and the association as a whole, in the usual manner and by the payment of a transfer fee of \$1.

Section 3.—Every active member in good standing shall have a vote and voice in the proceedings of this association and be eligible to office.

Section 4.—Each firm, corporation or company shall designate one individual who shall act as official representative. He shall have the right to vote and to hold elective office.

Section 5 (A).—Every member in good standing is entitled to the assistance of the association to protect his business interests.

(B).—The manner of procedure to receive such assistance is as follows: A member wishing to avail himself of the privilege above set forth must file a written statement of his case with the president of the association who, upon receipt of same, shall immediately call a meeting of the board of mediation, who shall decide whether or not the member requesting the assistance is entitled to same.

(C).—If a member shall feel dissatisfied with the decision of the board of mediation he may appeal to the association.

INITIATION FEES AND DUES

Section 1.—Initiation fee for regular membership in the association shall be \$25, which fee shall accompany the application which shall be held to include as well, all dues until the first of the following month. If any applicant shall fail of election to membership, such fee shall be forthwith returned to such rejected applicant.

Section 2 (A).—Each active member shall pay to the secretary of the central body upon the first day of each and every month, in advance, as dues, the sum of \$2, which shall entitle such member to all the privileges of the association as governed by the constitution.

(B).—The secretary of the central body shall hold from such receipts, the portion or share or tax this association is liable for, according to the amount decided upon by general meeting of delegates from all divisions and the balance, after such deduction is made, is to be returned forthwith to the secretary of this association, who will immediately turn same over to the treasurer, taking his receipt therefor.

Section 5.—All such members of this association who desire active membership in any or all of the other divisions shall pay, the same total dues, this amount being divided by the number of divisions they become active members in, and an equal division or share being paid in to the respective divisions.

Any active member of this association in good standing whose business interests warrant that he take active interest in more than one division, may make application to such division for active membership in the regular way and if accepted may attend and vote on all matters for any of the respective divisions, the amount of his dues being determined by article V, section 5.

SUSPENSION AND REINSTATEMENT

Section 1.—Membership in this association may be terminated for the following causes:

(A).—Voluntary resignation.

(B).—For non-payment or any indebtedness beyond a period provided for by these by-laws and constitution.

(C).—For action or conduct that should be deemed injurious to the interest or the welfare of this association or at variance with its constitution and by-laws.

Section 3.—Termination of membership for any cause whatsoever shall operate as a release of any right or title or interest in the property of this organization.

Section 4.—Any member who shall allow his account to be in arrears for the stated time of sixty days shall forfeit all right to vote or hold office until such dues are paid.

Section 5.—Any member who shall allow his account to

be in arrears for the stated time of ninety days shall be subject to suspension and his name shall be brought before the membership at large, after due notice having been sent to him.

Section 6.—A member suspended for reasons mentioned in the previous section, permitting sixty days to pass before making his application for reinstatement, may be reinstated upon the payment of his account in full to date and the regular initiation fee.

Section 7.—Any member may retire from membership by giving written notice to the secretary and making payment of dues to date but all members shall remain liable to the association for dues until such notice is received.

MEMBERSHIP CARDS.

The association shall issue semi-annually membership cards to insure correct accounts.

STANDING RULE

Resolved, that for a period of ninety days from date of adoption of the constitution and by-laws of this association, the initiation fee will be waived in favor of all members joining this association after which the rules as applied in article 5 on initiation fees and dues of the by-laws will be applied.

The following is a list of active members pledged to support the association:

Harry Salvat, Fashion Auto Station Corp., 740 E. 51st St.; C. F. Wiedmaier, Wiedmaier Garage Co., 1169 E. 55th St.; Wm. C. Hatley, Royal Electric Garage, 339 E. 55th St.; R. F. Patterson, R. F. Patterson Garage Co., 4510 Cottage Grove Ave.; J. C. Nickels, Grand Boulevard Garage, 3993 Grand Blvd.; N. E. Lemmon, Bland Electric Garage Co., 418 E. 47th St.; J. B. Anderson, Jr., Columbia Garage Co., 3335 W. Madison St.; C. S. Ross, Terminal Garage, 4466 Broadway; H. E. Halbert, Garfield Park Auto Garage, 606 Independence Blvd.; Wm. Jones, Jones' Fashion Garage, 2645 No. Clark St.; Rob't. Bland, Rob't. Bland Electric Garage, Benson and Clark Sts., Evanston, Ill.; C. A. Christ, Hyde Park Hotel Garage, 5122 Lake Park Ave.; Wm. L. Rudd, Wm. L. Rudd & Co., 1112 E. 47th St.; W. C. McNitt, Hollywood Garage Co., 5656 Broadway; F. E. McCall, Commonwealth Edison Co., Adams & Clark Sts.; D. B. Parker, Electric Storage Battery Co., 140 So. Dearborn St.; D. C. Arlington, Philadelphia Storage Battery Co., 2612 So. Michigan Ave.; J. M. Volkhard, Jr., Volkcar Storage Battery Co., 2437 So. Michigan Ave.; Fred B. Schaefer, ELECTRIC VEHICLES, 1243 Monadnock Bldg.; J. R. Buck, McDuffee Auto Co., 2457 So. Michigan Ave.; Gail Reed, Walker Vehicle Co., 2700 Michigan Ave.; F. D. Cerf, Ralph Temple Auto Co., 1219 So. Michigan Ave.; P. R. Higginbotham, Woods Motor Vehicle Co., 2500 Cottage Grove Ave.

703,527 Automobiles Made During 1915

Motor car figures for the past year, as compiled and just announced by Alfred Reeves, general manager of the National Automobile Chamber of Commerce, show the production to have been 703,527 cars, valued (wholesale) at \$523,463,803, which is an advance of 36 per cent in the number of cars, and more than 10 per cent in value over the previous twelve months.

With the lowering of prices resulting from increased production and standardization of many parts, together with the present low cost of upkeep of automobiles has come a demand that was never dreamed of by the greatest optimist a few years ago. The call for the big, luxurious cars continues, although the greatest sales during the past year have been in the rural districts, where the automobile's value as a time saver is appreciated in the highest degree.

Sales of pleasure or passenger cars of all types to June 30, which is the end of the year in the industry, were 665,826, for which the manufacturers received \$450,941,131, while the sales of commercial vehicles of all types are estimated at 37,709, valued at \$72,522,692. The figures for twelve months ending June 30, 1914, were 515,101 cars, passenger and commercial, valued at slightly more than \$485,000,000.

While the number of cars increased 36 per cent, the value the makers have been giving purchasers as

manufacturing costs were brought down and fewer changes were made in chassis construction.

More than 2,000,000 cars are now registered in the United States, based on the reports of the States which require registration. Detailed figures recently compiled by *Automobile* from official sources show the following registration by States, deductions having been made for duplication of registration during the first six months of 1915:

New York	185,767	Oregon	20,419
Ohio	152,950	Virginia	17,799
Illinois	151,832	Maine	16,865
California	138,600	North Carolina	16,315
Pennsylvania	128,062	South Carolina	16,000
Iowa	117,407	Rhode Island	15,000
Michigan	93,669	Kentucky	14,820
Minnesota	82,000	Florida	12,493
Indiana	81,208	West Virginia	12,000
Massachusetts	76,168	Alabama	11,800
Texas	72,433	Montana	11,000
Wisconsin	70,490	New Hampshire	10,422
Missouri	64,460	Vermont	9,489
Nebraska	60,000	Dist. of Columbia	8,500
Kansas	59,485	Mississippi	8,500
New Jersey	58,179	Arkansas	7,200
Washington	35,000	Utah	6,615
Connecticut	34,199	Idaho	5,928
Maryland	25,732	Arizona	5,246
Oklahoma	25,000	Delaware	4,135
Tennessee	24,951	Louisiana	4,000
North Dakota	24,000	New Mexico	3,695
South Dakota	22,700	Wyoming	3,262
Georgia	22,150	Nevada	1,190
Colorado	21,588		
Total			2,070,903

As showing how great is this gain in automobiles, the following facts are reduced in comparative form by "Automobile," the variation from the Chamber of Commerce figures being due to the elimination of exports, especially of trucks.

	Registration.	Production.
1915 to July 1	2,070,903	*625,000
1914	1,754,570	515,000
1913	1,253,875	450,000
1912	1,010,483	378,261
1911	677,000	209,957

*Estimated.

While one concern alone has manufactured over 300,000 gasoline passenger cars, the other makers of this type of vehicles have almost all increased their outputs, while the manufacturers of electric passenger cars and those of trucks of all classes have found their factories taxed to the utmost to keep up with the growing demand. In addition to the 300,000 cars made by one company there are several other concerns building from 50,000 to 100,000 cars yearly, and a larger group of manufacturers who may be credited with turning out from 10,000 to 50,000 cars.

One of the phenomenal features apparent to anyone analyzing the registration statistics for the past two years is the gain made by the states whose populations are for the most part devoted to agriculture. These growing statistics serve to emphasize the reports to the effect that farmers throughout the country and especially throughout the grain belt of the Middle West, have been buying cars in constantly growing numbers and are still buying them.

In Ohio the Terrill bill, making the owner of an automobile responsible for any accident, no matter who drives the auto, was beaten overwhelmingly in the house.

Trouble-Proof Trucking

How the New Method of Selling Battery Service Instead of Kilowatts Has Solved the Problem

MOST of the trouble in this world is the result of misunderstanding. Take the electric vehicle as an example.

BY FRANK B. RAE, JR.

The development of electric "teaming" has been slow for the single and simple reason that the several parties interested haven't understood each other's point of view. The electric vehicle has been right for years. Electric batteries to propel it have been right. The cost of electric energy for charging the batteries has been right. But the individuals interested have been at loggerheads—or at least they have worked at cross purposes. That has been the trouble with electric motor car.

Two parties are vitally interested in the continuously satisfactory performance of the electric commercial vehicle—the electric light man who has current for sale, and the merchant or manufacturer who has goods to move constantly. In the past, these two have misunderstood each other. The merchant or manufacturer has been trying to *buy motor vehicle transportation*; the electric light man has been trying to *sell kilowatt-hours of current*. The result has been about comparable to what would happen if you ordered a broiled fish in a restaurant and the waiter brought you an outfit of fishing tackle. Or like handing a milk ticket to a baby that is yelling for its bottle.

Now it is a sound commercial principle that if you want business you must reduce your proposition to terms that will satisfy the prospective customer. In the case of the electric vehicle proposition the customer wants transportation measured in car-miles. He does not give a whoop about kilowatt-hours. He is interested in moving goods economically, surely and with despatch. He knows little, and cares less, about the technical and engineering feats that must be performed to supply the means of locomotion. If he could use dogs or aeroplanes more economically and satisfactorily than he now uses horses, he would sell his barn and erect a kennel or a hangar.

It is because we in the electrical industry have finally recognized this rather obvious fact that the battery service system has been devised.

THE BATTERY SERVICE SYSTEM

The battery service system is simply a method of selling electric motor car transportation by the car-mile instead of trying to sell electric current for battery charging by the kilowatt-hour. It is a method which relieves electric trucking of all uncertainty. Under the battery service system, the electric light man says to the merchant or manufacturer: "It will cost you so much per mile to operate this electric motor truck." That's all there is to it.

Boiled down, the proposition is this:

The customer buys his electric wagon or truck without batteries. That saves him about 20 per cent to 25 per cent on his original investment. The lighting company owns and keeps ready for service a sufficient number of batteries to keep all the cars running all the time. When a battery is about exhausted, the customer brings his car to the garage for a "battery exchange" and in three minutes is on the street again with a fresh battery.

In a sense, it is like the modern milk delivery system. Years ago, the milkman ladeled out milk from the can into the family pitcher; today he delivers it in a company-owned bottle. Similarly, the common practice has been for an electric lighting company to deliver current to the customer's battery: the new system delivers the current "bottled" in a company-owned battery. In other words, the company is selling "canned" current instead of "loose" current.

The customer pays so much per mile for whatever distance his car travels and he can travel as far as he wants to, using up the energy in several batteries a day if his business demands it. Thus, there is no mileage limitation whatever placed upon any electric car that uses the battery service system. The customer has no reason to worry about hills, snow, mud or axle grease. All the uncertainty which exists in the layman's mind regarding the efficiency, life and care of batteries is also removed.

There is nothing philanthropic about the company's doing this: the battery service system is a business proposition in averages. The schedule of rates is figured as scientifically as a schedule of insurance rates, and upon the same principle. The element of chance or hazard is not a gamble but is business risk reduced to a percentage basis. Without doubt, service is sometimes rendered at a loss, but then, insurance companies sometimes pay claims for thousands when they have received only a few dollars in premiums. Similarly a merchant averages his loss on a slow-moving line of goods against his profits on a quick turn-over: a manufacturer fixes his selling prices to take care of emergency items such as broken machinery and spoilage: a street car company averages long hauls against short hauls. With this system, the car-mile rate is based upon the average car-mile cost, with all the variables figured in. And because the electric light company is caring for and charging a great number of batteries under the expert supervision of specialists, in a garage and charging station wherein every possible facility for economy is provided, the car-mile rate they charge under the system averages less through the year than the kilowatt-hour rate would come to except in garages approximately as large and as well equipped.

The battery service system is not new. It has been in operation for two and one-half years in Hartford, Conn., and for shorter periods in other places. It is a success. If proof of this success were needed, it is contained in the fact that Hartford is buying a car per year for each 7,000 of population, whereas the records show that a good general average of sales in cities which do not have such a system is a car to each 125,000 of population. Any proposition that results in 18 times the normal amount of sales may safely be termed successful. And another proof of success is that over half the electric vehicles purchased in Hartford have replaced gasoline cars.

The wide variety of service given under the system in Hartford is suggested by the reproduction of a full-page newspaper advertisement which the company printed in its local papers about a year ago. Here we find pictures of wagons and trucks used to handle coal, milk, groceries (wholesale and retail), ice cream, men's furnishings,

baked goods, laundry and for general expressage and trucking. The cars sold have traveled 1,056,525 miles, to March 1, 1915.

Among the most interesting cases is that of a 2,000-pound wagon owned by W. F. Griswold, a dairy farmer located seven miles from the charging station. The following description of this machine and its work appeared in *The Motor Truck*:

W. F. Griswold has a farm at Rocky Hill, seven miles distant. He has nearly 100 cows and produces more than 1,000 quarts of milk daily, which is distributed by two routes in Hartford. The longest route was 25 miles, on which was delivered about 625 quarts of milk and cream, and serving this in the summer three horses were used, each making 25 miles for two days and resting the third day. In winter four horses were used each pair working alternate days. On the other route the work was not as hard and the animals could be worked fairly regularly in summer, and alternated in winter, as conditions required.

Milk was delivered each day at the store of the Boston Branch Grocery, which operates the largest number of electric wagons in service in Hartford. After observing these for a considerable period, and learning of the battery service system, Mr. Griswold ordered a 2,000-pound wagon, which was delivered July 18, 1914. This machine has been operated each day since delivery, being driven by a son of the owner, . . . and each day at noon the battery is exchanged. The mileage at this season is approximately 25 a day.

The young man serves 325 customers, which means that many stops. With a boy he leaves the farm at 6 o'clock and is back by 1:30. A typical load was 22 cases of 12 quarts, 12 cases of 20 pints, in bottles, four 40-quart, one 30-quart and two 10-quart cans. This was a total of 594 quarts of milk and cream, weighing, with the containers, about 2,500 pounds. The wagon is driven under a shed at the farm, there not even being a garage.

During the period of the year when the crops are harvested, the wagon is loaded with produce or fruit and makes a second trip to Hartford, this bringing the mileage for the extra trip days to 40 or 45, but during the winter the route alone is covered. The monthly mileage will range from 750 to 800 in winter and from 150 to 200 miles more in the warm weather. Since the electric wagon was purchased the number of horses used for the farm has been reduced from 16 to 10, so the machine can be regarded as practically replacing six of them. Since the wagon has been in use but one delay, for a half hour, has been experienced, and the driver says that he never could have done as well with animals.

This is but one example of many in Hartford. It is chosen because it represents hard operating conditions as is evident from the figures—a route of 25 miles with 325 stops to be covered in 7½ hours—the wagon starting with 25 per cent overload and going its route for 7 days a week with only a single half hour delay within the first 8 months. Contrast this hard, wearing service with the service or operating conditions of a wholesale grocer's truck, for example. It might travel but 25 miles, not in 7½ hours, but in 10 hours, over good city pavements and have to make only 100 stops. Obviously if a high grade electric truck can beat out the horse on a milk route where operating conditions are abnormal, it can give the horse even a better run for its money on congested city streets. For the electric is at its best in the thick of the fight. The electric is more than a shunting engine but it isn't a through freight engine. That honor falls to the gasoline truck. The trouble is that a lot of firms have been burning up money by using the through freight engine in the yard, namely, the city, forgetting that about 80 per cent of all the average city trucking can be done by the electric truck. That is, such work is in the field of the electric, and that being the case no other machine can do the work so well or so cheaply.

On February 14, 1912, there were 14 cars operating under the battery service system in Hartford; on January 1, 1914, the total increase was over 300 per cent, while January 1, 1915, showed a 50 per cent gain over 1914.

Considering the size of Hartford, that is a record for continuous, uninterrupted vehicle success which is as yet unmatched anywhere in the world. Yet in half-a-dozen other cities where the system is now being established it seems probable that Hartford's wonderful record will be speedily over-shadowed.

And why?

Simply because the system removes the misunderstandings that heretofore have always existed between the man with goods to move and the man with current to sell. The removal of misunderstanding removes the troubles and disappointments which were caused by this misunderstanding. Under the new system, the electric light company provides what the customer wants—that is, electric transportation, measured in car miles.

The system removes every disadvantage to electric motor car transportation and leaves only its advantages. As every man knows who has ever talked electric trucks to a prospective purchaser, the contra arguments are only four: (1) high first cost of the vehicle; (2) limited mileage on one battery charge; (3) uncertainty as to efficiency, life and care of batteries; (4) uncertainty as to actual cost of operating the car. The new system eliminates these arguments—wipes out these objections. (1) The vehicle minus battery is not high in cost. (2) Mileage under the battery service system is unlimited. (3) The battery and its troubles, if any, no longer concern the vehicle owner, but are of interest only to the lighting company. (4) The cost of operation is a fixed rate per car-mile.

So the whole proposition simmers down to a simple little question in arithmetic, thus: Find out how much it costs to deliver or truck goods under old methods; subtract the amount it would cost to do the same amount of work electrically under the schedule of the system, and the difference between the two amounts is the net saving effected by the truck owner.

"But what if there is no saving?" asks the skeptical man.

Then study the figures and find what has been left out of the costs under the old method. If *all* the costs are figured in, the chances are about 100 to 1 that trouble-proof trucking by electricity shows a definite economy in dollars and cents, and this without taking into consideration such items as:

Reliability; flexibility; cleanliness; ability to operate in both blizzard and heat; capacity to handle occasional heavy overload.

The man who sells—or the man who buys—electric transportation under the battery service system is dealing in proven figures, not in estimates. He is dealing with definite facts, not in arguments. And that is another advantage of the system—it saves a lot of talk.

Waverley Electric Price Reduction

The Waverley Company, Indianapolis, Ind., will increase its 1916 production to 2,000 cars, or approximately 100 per cent. A result of this proposed production is a general lowering of prices ranging from \$1,000 to \$500, effective August 1, last. The following list gives the former and new prices:

Model	Old Price	New Price
108-5-Passenger Limousine	\$3,500	\$2,500
Roadster Coupe	2,000	1,750
109-Four-Chair Brougham	2,750	2,500
104-Front-Drive Four-Pas. Brougham ...	2,400	2,000
105-Rear-Drive Four-Pas. Brougham.....	2,350	1,900

Making Your Old Car Look Like New

A Discussion of Methods and Materials Used in Repainting Vehicles

AUTOMOBILE painting is probably one of the most important, yet least discussed, branches of the automobile industry. It is true that a certain knowledge is necessary to get successful results in this line of work. But that knowledge, or as much of it as is necessary, is furnished by various painting concerns in printed instructions, together with all the necessary materials with which to bring your car back to its original lustrous beauty. The only ingredients you have to furnish are care, a suitable place to work, and some common sense.

If the paint has flaked away from the metal of the body and shows signs of going at other points, you had better repaint it "from the ground up." This is a longer and more tedious job, but if the original paint has started to scale, new varnish over the top will not hold it in place very long, and your work of varnishing will have gone for nothing. If the original paint is in fairly good shape, and is not scaling off at any point, a good rub down with sandpaper and then a coat or two of color, with a varnish coat on top of that, will give you a good looking car.

The first and most important requisite is a suitable place to work in. This must be absolutely free from dust, for obvious reasons. It must be warmed, if the work is to be done in the winter time, so that the paint will have a chance to dry, and it must be light enough for you to see very plainly, as no one can do good brush work in the dark.

Before you put the car into your paint shop, give it an absolutely thorough washing, going carefully over the entire exterior with a soap and water solution, and using a brush to get the mud out from the corners. If you are not going to remove the old paint, after you have washed the car with soap and water, go over all of it carefully with gasoline. This is to remove any oil which would prevent the paint from holding well.

Should you decide to remove the old paint, there are two methods of doing it. The paint can be burned off with a gasoline torch, or it can be dissolved with a paint remover. The first method requires considerable skill to get good results, but the use of the latter is simple. Paint remover can be obtained at any paint store. It is to be applied to the old paint, and allowed to stand until the paint has softened and can be removed with a rag or a putty knife. Use plenty of remover and get off all the old paint; then wash down again with gasoline.

Now any cracks and holes must be filled up with white lead. This should be thinned with turpentine when it is placed in the cracks, but can be used in its normal consistency for the holes. Allow it to dry thoroughly, then rub down with fine sandpaper to an even surface.

The car is ready now for the first coat of paint, or filler. This should be applied with a soft brush and care taken not to get the body streaky. The first coat should be permitted to dry thoroughly, the time required being about twenty-four hours. While drying, the temperature of the room should be kept as nearly constant as possible. Drying is best accomplished in a room where the temperature is about 70 degrees

Fahrenheit. All windows should be closed to prevent dust settling on the fresh paint. After the first coat has been applied, and dried, the surface should be rubbed down carefully with fine mineral wool, then remove all dust and apply the second coat. If you use a heavy dark color, blue, Brewster green or black, two color coats will probably be enough. Rub down after each coat. Sometimes, when light colors are used, as many as ten coats are necessary to get an even tone and, at the same time, cover up all the white-leaded spots. The more dense the color the fewer the number of applications necessary. One can tell whether or not enough coats have been applied, for if it appears well to the eye no more need be applied.

After the last coat of paint is thoroughly dry the car is ready for the varnish. When purchasing ask for body varnish. With the body varnish should be mixed a small quantity of the paint, but only enough to give the mixture a slight color. The combination is called color varnish and is used primarily to retain the richness of the paint previously applied. The varnish alone may be used, but much better results are obtained when the color is mixed with it. Do not use the soft paint brush for applying the varnish. A stiff brush is used for this operation.

After the varnish has been allowed to dry the next operation is facing the car. A very fine grade of powdered pumice should be used. First take a big sponge, soak it with water and rub over the surface of the car. Then take a clean cloth and wet it. Dip it then into the powdered pumice, which should be contained in a box. Rub the pumice over the varnished surfaces lightly for about one minute. The reason the pumice is applied is to remove all high spots from the surface and make the latter smooth. The pumice, after having been rubbed in lightly, should be wiped with the sponge soaked in water. Dry the parts well with a clean cloth.

But a small section should be worked upon at one time; not the whole body pumiced at once. After the entire car has been rubbed with pumice another coat of color varnish should be applied, and all the parts rubbed again with pumice. After this operation the car is ready for the striping, which, when complete, makes the car ready for the last coat of color varnish.

Striping is beyond any amateur, for it requires great skill. However, in place of striping, you can pick out the mouldings and dot the wheel bolts with a darker color, and this gives much the same effect.

Now apply, very carefully, the last coat of varnish, and allow the car to stand at least a week before taking it on the road. Before it is run out of the shop, wash it down thoroughly with cold water. This helps to set the varnish.

Pittsburg has issued a warning, following the death of a child who was run over by an automobile driven by a fourteen-year-old boy, that parents are responsible for any accidents in which their cars figure if driven by minors, and the city declares that action will be taken against parents who allow children under 16 to drive their cars.

Automobile Trucks for Delivery of Coal

Motor Trucks Extend Localized Retail Business into Unlimited Territory

RETAILERS conducting a typical business frequently put a limit on the territory to which they will deliver. They soon learn that taking too large a proposition of long-haul business, is tying up equipment on unprofitable orders, instead of confining the operations of his teams to those sections which can be furnished at a reasonable expense of time.

Excessive hauling costs knock the profit out of a great many retail coal businesses. It is the one item which often does not seem subject to revision, but insists on remaining higher than the margin which the dealer has to work on would indicate as proper.

This being true, many a retailer contents himself with doing a circumscribed and localized business, for the sake of holding down his delivery expenses, and making a profit on the limited business he does handle, simply because he knows that if he went after and got a considerable tonnage outside of his territory, he would probably handle it at a loss. And as taking care of an increased volume would mean more overhead expense in the form of equipment, office and other operating costs, collection expenses and credit losses, etc., he philosophically decides to make the most of his loaf, small as it is, rather than risk losing it entirely through trying to get a larger one.

As to the proposition of adding a charge for long hauls, this is out of the question, except when the dealer is in possession of some special advantage which attracts business in spite of the extra charge. In one city a concern which was established on a cash basis sold its coal practically f. o. b. yards, and established a scale of delivery charges, the whole city being divided into zones, and those furthest away from its yard paying the top price. This was entirely fair from the standpoint of the dealer, but under ordinary conditions it would be the dealer who would lose, and not the customer, because such a plan would automatically drive away those in the more remote zones. In this case the concern happened to be one of the few selling for cash, and as it was handling a grade of coal which enabled it to make a very low price, it was able to book orders from all over its community, and to get the delivery charges which it assessed.

But all of these plans are more or less undesirable and unsatisfactory. One neither wants to have branch yards, with all of their inevitable expense, risk and increased responsibility; co-operative arrangements involving trading orders with competitors, nor a zone system of delivery charges. What then?

The motor truck seems to answer this question, at least in communities of the average size, say 300,000 or under. And as population is not always determined by area, it might be better to say that in a city where the furthest limits are not more than five miles distant from the yard—which would allow for a community ten miles in diameter, or 100 square miles area, assuming that the yard was at the center—a motor truck will give the retailer command of the whole local field.

The truck "eats" the long hauls. This does not mean that it can deliver coal ten miles away more cheaply than a horse-drawn wagon could deliver it

there; but the reduction in cost for deliveries of the same length is so great that it enables the dealer to go into territory from which he has been absolutely barred heretofore.

Though the cost of delivering coal is not subject to published tariffs, but must be figured out by every dealer for himself, the charge is there, and it increases directly with the distance. Hence the dealer who wants to handle only profitable trade is distinctly limited as to the field of his operations.

If that limit has been established on the basis of horse or mulepower, and if motor trucks will reduce the delivery expense, it follows immediately that the use of motor trucks in place of or in addition to animal power will extend the field of operations. He can deliver at a profit to points which could not be reached on that basis theretofore. The dealer suddenly finds himself with increased opportunities to sell coal and make money in the operation. Instead of being confined to one local territory, he is lord of all he surveys.

This change has come about in a good many instances. There is one coal yard which has leaped almost overnight, it seemed, from an obscure, unknown concern to a position of prominence in the trade. And it has done so simply by putting a number of motor trucks to work. Formerly it made no effort to get business outside its own bailiwick, within which its wagons could go without too great a loss of time, which meant money. Now it is actively seeking business all over the city, knowing that it can handle it at a profit, by means of the use of its trucks.

In discussing the subject of auto trucks versus teams at the annual meeting of the Illinois and Wisconsin Retail Coal Dealers' Association, James B. Dooley, of Peoria, said in part:

Much has been said for and against the use of the auto truck in the coal business. My opinion is that the auto truck has come into the coal business to stay. In cities and towns where conditions are favorable, such as paved streets and alleys, the auto truck can be used profitably as against team hauling.

The average dealer, looking with grave concern upon the large amount of initial investment necessary for the purchase of an auto truck and equipment, and with the idea in mind that his purchasing of such equipment would be nothing less than a luxury that he can easily get along without, gives the matter no further thought until he again receives his monthly statements for shoeing, feed and wagon repairs.

We will take into consideration the comparative costs of auto truck equipment and three teams and equipment: Three teams, \$1,200; three sets of harness, \$180; three wagons, \$750; total, \$2,130. A 2-ton truck, capable of hauling three tons and equipments, \$3,000 to \$3,500.

Of course, considering the first cost there would be a saving in purchasing teams as against the truck, but right here we call your attention to the fact that a good portion of the extra cost of the truck could be charged to advertising. Surely any such new features added to your service equipment has considerable advertising power which is extremely valuable.

Boosting Electrics in New England

Manufacturers of Vehicles, Batteries and Accessories Suggests Plan for Central-Station Co-operation

CENTRAL stations of New England have been presented by a committee of manufacturers with a plan for increasing the use of electric vehicles based on a co-operative policy outlined as follows: In presenting the new policy to the lighting companies, the committee points out that the earnings to be derived from the extensive use of electric vehicles make it a matter of importance to the central stations to use their influence in the right way to promote their rapid adoption for pleasure and commercial purposes. It says that the best method of adding the needed stimulus of central-station assistance has been sought frequently and earnestly by all concerned, and claims that the plan outlined possesses merit and is entirely feasible. The committee, representing manufacturers of electric vehicles, batteries and accessories, is convinced that the adoption of such a policy will result in the development so mutually-desirable.

ADVANTAGES OF ELECTRIC VEHICLES

The committee has enumerated six distinct reasons why electric vehicles should be installed and why central stations should adopt the policy outlined. These are as follows:

"First—You will admit at the outset that in order to put the use of electric vehicles on a sound and permanent basis it is essential that every economy possible of attainment from their use be made available to the present or prospective user. No other policy can insure success.

"Second—It is a recognized fact that the transportation of merchandise can be done with economy by horses, gas trucks or electric trucks. That a proper selection of the correct method of haulage depends upon an intelligent study of the individual case is self-evident. Any such study will quickly reveal that in many cases the margin of saving from the use of either the gas or electric truck in preference to the horse is small and frequently intangible to a prospective user of gas or electric trucks.

"Third—If the selection of the type of delivery system best suited to serve the needs of individual customers varies with conditions, it must be admitted that the method of operating the selected system is none the less open to investigation and must also be considered carefully in connection with the system selected and operation required.

"Fourth—Recollect that electric vehicles can be operated with economy either by the use of a battery exchange system or individual charging boards, and here again the better of the two methods must be determined by an analysis of the prevailing or expected conditions. It is also important to remember that with the standardization of both of these methods of charging the central station is in a position to meet every application with its proper solution, resulting in a larger profit than if either method is advocated to the complete or partial exclusion of the other.

"Fifth—It is obvious that the slowness of the public in general to adopt the electric truck in any fair proportion to its advantages is due mainly to popular impression that anything electrical is actuated by some

mysterious power capable of control and, in the cases where storage batteries are concerned, of replenishment only when handled by men specially versed in the art.

"Sixth—It is admitted that within its proper radius of action an electric truck will operate at a saving of from 20 per cent to 50 per cent over a gas truck. The incomparable advantages of an electric pleasure vehicle, when it is used within its sphere, have long since ceased to be disputed. Nevertheless the use of gas trucks and pleasure cars is increasing at a much faster rate than is the case with the electric vehicle. What a monument to misconception! And what a splendid opportunity awaits any central-station manager who will consider carefully, plan broadly and act fairly!

"Let the public served by you realize that you are using and can honestly recommend electric vehicles. Establish two general methods of charging—first, offer a battery-exchange plan, open on the equal terms required of a public service corporation to any applicant; second, make charges by means of individual charging boards owned and operated by your customer. Also establish a bureau of information for present and future users of electric vehicles in your territory, from which bureau information helpful to the trade should be issued to it simultaneously and with exact impartiality."

SUGGESTIONS TO CENTRAL-STATION MANAGERS

In explanation of the plan above outlined the committee says:

"First, it states that you are to use and recommend electric vehicles where proper to do so. Surely no hardship is imposed by such a requirement. Can any manager grumble at double profits secured from the modern tendency of rate reduction?

"Next, establish two general methods of charging. Why not establish and encourage as many different methods as will serve electric-vehicle users to their profit and satisfaction, thus increasing the permanent revenue of the central station and enabling it to build up its 'off-peak' load at a fraction of the effort expended at present to fill up the valleys in the load curve? And what is there new, novel or exacting in either of the general schemes of charging proposed under this plan? The battery-exchange plan is old. It is now available with equal facility for any make of truck, owing to the use of universal battery compartments by all the leading makers of vehicles, and standard battery dimensions have long ago been realized within easy working limits. This plan of charging presents no difficulties to the central station, and its adoption as a stimulus to the industry will be beneficial indeed, especially as public service officials will realize, without the necessity of illustrative examples, the prime importance of preventing the public from gaining the impression that the central station can or will favor special interests. The handicaps of individual charging have been removed with the perfection of the batteries and introduction of simpler and fool-proof control equipment. Such individual charging installa-

tions should always be advised by the central station when prevailing conditions make it possible for the user to avoid the overhead charges of the battery-exchange or mileage plan of service. And to follow such a plan means more revenue for the central station resulting from the sale of energy minus extras; that is, gives you the maximum possible profit and automatically brings the user nearer to the economic ideal. Indorsement of the charging-at-home plan will offset the inference created by the establishment of a universal battery exchange, that electric vehicles are still in the infantile stage and require trained nurses, and thus make it possible for the central station to furnish this double service without the possibility of inadvertently destroying the paramount simplicity argument of the electric-vehicle salesmen.

"And, finally, the wisdom of bureaus of information maintained by central stations to capitalize their local prestige is unquestioned to-day. The civic trend of modern times makes it as foolish as it is futile to attempt to develop any great instrument or institution of public service along the lines which savor of favoritism or monopoly.

"A representative committee is ready to assist you in the perfection of the plan outlined above."

The letter is signed by Mr. M. E. Brackett, Boston branch manager General Motors Truck Company, as chairman, and a committee comprising Messrs. Floyd T. Taylor, district sales manager Cutler-Hammer Manufacturing Company; R. B. Daggett, manager New England district Commercial Truck Company of America; P. E. Kelley, manager Boston office Philadelphia Storage Battery Company; George W. Holden, New England manager Edison Storage Battery Company; W. E. Haseltine, assistant general manager Holtzer-Cabot Electric Company; John A. White, New England manager United States Light & Heating Company; M. O. White, Boston manager Ohio Electric and Ward Electric Truck companies, and J. W. Emery, New England manager Walker Vehicle Company.

Holding Down Motor Truck Costs

To control the operation of his motor trucks, and make sure he is getting a full measure of service from them, the owner of motor trucks needs daily reports and monthly and yearly comparisons. These will show up leaks, if there are any, and may point ways to better the service.

It may be said, in general, that the operating expenses of motor trucks are based on two elements—time and the work accomplished. Expenses depending on time are relatively fixed charges and have to be borne in any case; while those depending on the amount of work accomplished go up or down, according to how far the trucks run and how heavy their loads are.

This division of expense furnishes the owner a basis on which to establish a system of accounting for his motor trucks. The first thing to be done is to determine what items belong under each heading.

Interest, depreciation and insurance are all fixed yearly charges. It is best to reduce them first to a monthly basis and then to a daily charge. Wages and garage rental, usually based on a monthly rate, may also be reduced to a daily charge. The sum of these items will represent the expense of keeping the truck one day, idle or running. These fixed expenses can be charged against the truck on every working day.

Actual operating expense, and the record of work accomplished, may be kept by the driver or the shipping clerk, whichever one knows best what the truck is doing throughout the entire day. Usually, the driver can keep his record and turn it in when he quits work at night.

Cards for this purpose, therefore, may well be a convenient size to carry in the pocket. A five-by-eight inch card of stiff stock, which will not crease and break when folded, is convenient for the driver and can be placed nicely in a card file.

A sample card for this purpose should contain space for as complete a record as possible of the actual performance of the truck during the day.

The following are some of the items that any card designed for this purpose may well show:

Owner's No. of truck	Number of stops
Date	Location of stops
Starting time	Time at each stop
Time finished	Material loaded at each stop
Total time	Material unloaded at each stop
Miles run	Unusual delays (location and cause)
Amount of material hauled	Repairs made
Gasoline used	Incidental expense
Oil and grease used	Signature of driver
Description of mechanical trouble and its location	Signature of helper

These items tell the whole story of the operation of each truck, and from them the efficiency can be judged.

This information may be transferred daily to a "current expense" record sheet of each truck, which will tell the executive who has this work in charge, everything he needs to know. This daily sheet is an important record because it provides a constant means of supervising the operation at all times.

It is a good thing to have on this sheet a column to show a standard performance, based on an average cost per mile. This figure may be obtained from past performances of the particular truck in question, or others of the same type. By placing this column next to that showing the total daily expense, a quick measure of each day's operation is had.

At the end of the month, the totals of each item for each truck may be entered on a sheet which shows the total cost of each month's operations, for each truck, in detail. At the end of the year the cost of each type and size of truck and the effectiveness of its operation may readily be determined by entering the cost of each truck by months.

The total cost of operation is intended to give at a glance the monthly record of the whole transportation system; and this last-mentioned form may be used with practically no alteration for horse-drawn vehicles, as well as motor trucks.

Carefully kept, forms like these will enable the executive to analyze the figures easily, and possibly raise the standard of efficiency in trucking; either by increasing the amount of work or by reducing operating costs.

Cuyahoga county, in which Cleveland is situated, has announced a new basis for taxing motor cars, the changes being suggested by the Cleveland Automobile Club. New cars are to be appraised at full list price; 1915 models in use prior to April 1, 90 per cent of list price; 1915 models in use prior to January 1, 80 per cent of list price; 1914 models, 50 per cent of list price; 1913 models, 40 per cent; 1912 models, 30 per cent; 1911 models, 20 per cent; 1910 models and prior thereto, 10 per cent.

Wire Wheels for Safety, Economy and Reliability

Houk Wire Wheel Utility and Construction Discussed

NO movement has taken stronger hold, nor kindled in the constructive mind, greater faith and inspiration for the future than the marked progress in the development of means and methods for the protection of human lives. Its slogan "Safety First" inspires confidence on every hand; and the traveling public is now looking beyond its public carriers for this same thoughtfulness, and demanding that safety be the first consideration, no matter whether it be on rail or road.

In keeping with other branches of transportation, the automobile industry has advanced steadily in the building and refining of cars, looking to the ultimate when the motor car shall have the same relation to its early prototype as the steel wreck-resisting Pullman of to-day does to its predecessor, the relegated flimsy structure of wood.

There is an absolute parallel in the development of this safety first idea in the railway world and in the construction of motor cars. We see the same elements at work—more speed, more power, more weight—and the hopeless inability of wood to withstand this ruthless advance. The same transition from wood to steel has been going on and will continue, until not one stick is left, except, perhaps, it be for decorative purposes. The wood wheels of motor cars are the last important construction of wood to feel these impelling forces, which must ultimately prove their elimination and replace them with steel. Nowhere is there a better example of the eternal race for the survival of the fittest. Steel, the material, has always been destined to win. The American development, together with the simplification of mounting, and universal adaptation to American car and road conditions is exemplified in the steel wire wheel.

Wire wheels, while adding greatly to the strength and consequent safety of the car, still accord considerable reduction in weight over wood equipment. Paradoxical though this may seem, yet twenty to thirty per cent is none too high a figure to place on the saving in weight, depending on limitations of original design.

The great strength of the wire wheel, particularly the Houk type, and consequent ability to fashion it lighter and more resilient than wood, lies primarily in the use of the triple spoke system of lacing. This, for the first time, treats the motor car wheel as more than a simple means of support, by scientifically taking into account all the complex supporting, torsional, side thrust, and compound stresses here met with, and provides a rational system of trussing to effectively distribute and equalize these complicated forces.

From the very nature of its design and construction the wire wheel is an elastic, resilient medium of support.

This elasticity and resiliency of the properly constructed wire wheel makes of itself a true shock absorber of the unsprung parts of the chassis—ironing

BY C. R. KYTE*

out as it were that annoying undertone of vibration or tremor so trying to one, especially after driving any considerable time.

This elastic cushioning of innumerable road shocks not only affords personal comfort, ease, and luxury to the occupants of the car, but, by the same process, leads directly to dollars and cents economy in prolonging the life of both tires and the car generally, and even to less gasoline consumption, owing to better all-around efficiency of operation.

But just how strong is a properly constructed wire wheel as compared with fair equivalent in wood?

Wire wheels are designed and proportioned on the basis of very careful and thorough mathematical calculation and the factor of safety under all possible service conditions left enormously high. Wood-wheel design is seldom, if ever, the result of critical mathematical study, but simply made whatever appears in the eyes of the designers to be "heavy enough." As the result of this sort of designing, wood-wheel equipment has scarcely ever been *heavy enough* for the emergency side stresses due to skidding, dropping into ruts, taking sharp curves at speed, etc., as witness the never-ending trail of collapsed wood wheels with their attendant losses, ranging all the way from the single wheels themselves to the lives of those who trusted them. Wire wheels are practically indestructible. Independent and authoritative tests have proven them to have four to five times the carrying capacity and to withstand ten to fifteen times the side thrust of fairly equivalent wood wheels, and even under these conditions absolute collapse as in the wood wheel is impossible.

CONSTRUCTION

All of which brings us to a discussion of what is the most important phase of wire-wheel construction to-day, the value of triple-spoke lacing, and of the use of a positive, automatic-locking device.

Besides supporting the weight of a car or sustaining the radial load, in operation, a wheel performs two other very important functions.

First, it propels the car by transmitting the driving torque from the axle to the road surface.

Second, it withstands thrusts when the line of driving is changed or when side sway occurs which is due to driving over ruts or from skidding.

TRIPLE-SPOKE LACING

The fact that it is necessary for a wheel to be able to withstand these radically different and varying loads presented the biggest problem in the construction of wire wheels. Early efforts at design seemed to fail in appreciating the significance of the relation of these secondary stresses. So it was not until after many failures and exhaustive study and experiment that the system of triple-spoke lacing was successfully developed.

A rough tracery of the most marked phases of the development may be illustrated by the sketches below, progressing from "A," patterned after bicycle practice but long since discarded on account of its inefficiency

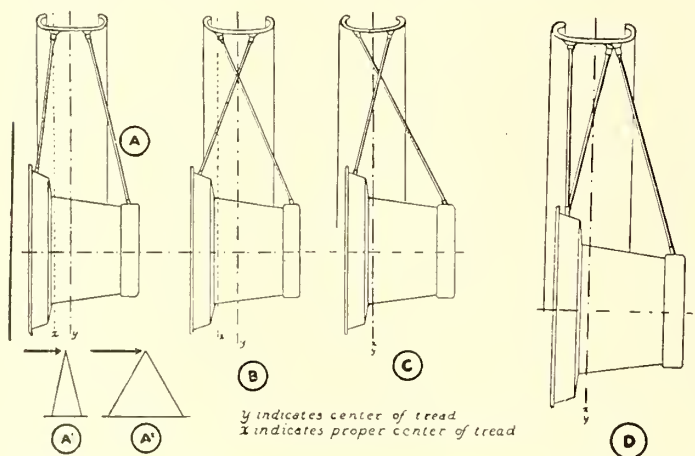
*Manager, Chicago Branch, Houk Wire Wheel Co.

and failure to stand up under motor-car service; through the stages of "B" and "C," in the attempt to provide greater lateral strength by crossing the spokes and at the same time hold the tread line somewhere near the same as in wood-wheel practice; to the final achievement "D" of the present accepted and ultimately successful design of triple-spoke lacing. Much has since been done, however, to improve and simplify the general construction, especially the mounting, to provide a universally adapted hub construction, at once simple, staunch, and fool-proof in its inherent safety; while at the same time commercially rational in its relation to American manufacturing and assembly conditions.

MOUNTING WIRE WHEELS

The basis of any system of mounting for wire wheels is, of course, the hub shell of the wire wheel itself, which in the Houk wheel, requires a total of twenty-three press operations to finish from the flat plate from which it is formed

Next, comes the mounting, or inner hubs fixed on the axle spindles, a few of the various examples of which are shown in the sectional cuts on page fourteen. These show, too, how the wire wheel hub shells are centered and clamped between the two opposing tapers, thus securing the wheels by the most powerful, accurate, and stable clamping means known to mechanics, showing also how the ample driving pins en-



gage the registering holes in the hub flange, itself reinforced with extra metal drawn out around the holes to provide additional contact surface and thus eliminate any tendency to wear. These drive pins as well as the hubs are treated by a special rust-proofing process, and the pins nickel plated, thus rendering corrosion or sticking of the parts together absolutely impossible, and so simple in its operation of attaching and detaching, that anyone can operate it without fear of getting it on wrong.

AUTOMATIC LOCK NUT

A feature quite as essential as the design of the wheel itself in the application of detachable wheels to motor cars is the means for holding the wheel on the fixed or inner hub. The prime requisite of such device is that it allows the wheel to be easily and quickly removed and, at the same time, that when in position they be held by simple, positive means not complicated by so-called locking devices or fixings that depend upon springs, pins, or any other extra parts which have

to be snapped or fitted in position, in order to prevent the members holding or clamping the parts from coming loose. All such devices are not only complicated and trappy by nature, but, in the end, depend on human agency and intelligence to see every time that they are fixed properly in place.

In the Houk wheel all such locking means have been discarded in favor of a positive single-piece clamp nut, completely automatic and self-tightening whenever the car is in motion, and, consequently, by virtue of this maximum of simplicity and automatic self-tightening, it is positively fool-proof, no matter under what condition used.

Both the principle of the operation as well as the device itself are so simple and obvious, that, when once understood, the absolute simplicity of the entire construction is the greatest guarantee both of its effectiveness and of its safety.

Quite naturally the most simple means of holding the detachable wheel in place is by a single nut screwed on to the end of the fixed hub member; and thereby clamping the parts together; but such a nut is liable to come off. The application of this patented device performs this dual function of clamping the two parts together and at the same time is automatic and self-tightening in co-operation with the parts with which it is in contact.

This clamp nut is essentially a ring, threaded internally, to engage the threads on the fixed hub, and, on the outside, tapering to clamp and hold the wheel hub shell in correct rigid position. These nuts are threaded for a loose running fit, and have their conical ends slotted into segments, allowing a slight compression when forced into the conical seat of the hub shell. By virtue of this fact that the nuts are threaded loosely there is a slight difference in the diameters, and a consequent greater difference in circumferential length of the threads. Thus, should the nut not be drawn up tight, through either neglect or intention, the wheel supporting the weight of car would bear upon the nut and hence upon the threaded hub in theoretical line contact. As the wheel and hub turn when the car rolls forward, the nut also turns, but only as it is carried forward by the line of contact. The threads, wedging together under the pressure of the load, after the manner of a cone clutch, prevent slippage between the threads, and, therefore, force the nut to lag behind the angular travel of the hub parts and, consequently, to screw itself on to the threads when they are properly positioned on the car—that is to say, on the right-hand side of the car the hubs are provided with left-hand threads, while on the left-hand side of the car the hubs have right-hand threads.

On the other hand, when the nuts are once in place, there can be no creeping action, as there is no difference in diameter or peripheral length, and they therefore clamp together in the conical end of the hub. Experience and repeated trial have demonstrated that if a nut is inadvertently left loose, the rolling of the car for only a short distance will suffice to tighten it. On the other hand, when the nut is brought home and this differential creeping action ceases, no amount of backing up would suffice to loosen it.

Tire changes, when necessary, are thus effected with the utmost simplicity of operation and consequent minimum of physical labor—simply one plain nut to be remove and replaced, which even the inexperienced can accomplish in but a few moments of time.

TIRE ECONOMY

We have touched on the general protection to the whole car afforded by the wire wheel, which in the end really spells economy of upkeep and operation, but the one great source of economy opened up by the use of wire-wheel equipment is the saving they directly effect on the tires. Tires last longer, give greater mileage, and, consequently, cost less per mile when mounted on properly constructed wire wheels than they do when mounted on the stiffer, heavier, heat-retaining wood wheels. This increased life of the tire runs all the way from 25 per cent to 70 per cent, this latter figure being an actual authenticated test extending over a six months' period of time, and with one hundred cars under identical conditions of weight, speed, roads, etc. Various conditions of operations as well as the tires used effect the saving recorded, but it always shows on the right side. Even suppose it is only 25 per cent, where is there another opportunity for so good an investment with added features of beauty, comfort, and life insurance thrown in?

How do wire wheels register this enormous saving of tires?

In two ways primarily.

First, by reducing the weight of the wheel greatly and in making that reduction at the rim or periphery of the wheel.

Secondly, by radiating the damaging external and internal frictional heat that the wooden wheel holds in the tire.

As the wheel revolves it is constantly coming in contact with the unevenness of the road. In other words, as your wheel revolves it is constantly striking blows against stones and rocks and depressions. Obviously, the harder it hits those rocks or depressions the greater the damage to the tire, and the heavier the wheel the harder the blow that is struck. Even if the heavier wheel carried its weight evenly distributed as between hub and rim, still the effect on the tire would be noticeable. And when, as in the case of the heavy wooden wheel, the extra weight is carried at the periphery, almost at the very point of road contact, the difference is tremendous. So that it is important to remember that the wire wheel makes the weight reduction almost entirely at the rim or periphery.

The wheel being a suspension wheel and built of elastic materials greatly reduces or absorbs the inertia of the blows, and on account of this inherent resiliency lessens this deleterious effect both on the tires and on the car as a whole.

The wire wheel by its elimination of peripheral weight overcomes the fly-wheel pound of the heavy rim wooden wheel—and here is effected the greatest tire saving.

Properly constructed wire wheels also protect the tires against overheating, and heat is the arch enemy of rubber.

A certain amount of heat is generated in the tires of an automobile whenever it is in motion. This is due chiefly to the internal friction in the tire itself, but under high speed is due also to friction between tire and road surface as well.

As the tire rolls along it is continually undergoing deformation and this kneading of the rubber and fabrics causes a great deal of friction within the molecular structure of the rubber as well as between strand upon

strand of the woven cotton mesh inside. This friction generates heat, which if not allowed to escape would soon rise so high as to burn and destroy the structure at once.

Radiation happily takes place to relieve the condition, but obviously anything that can be done to aid will prolong the life of the tires. Wood wheels with their generally double rims backed up by the wooden felloe as effectively prevent radiation as could well be desired. Wire wheels, on the other hand, with their light single thickness of metal rim, fully exposed to radiation, and this rim tapped, as it were, by the spokes at numerous points, form an almost ideal radiator, which effectively dissipates the heat and keeps the tire cool, thus greatly aiding in prolonging its life.

Tire mileage cost is, perhaps, the most serious item to-day in motor-car economics, but one fortunately which now has this simple means of conservation.

Again, let us not lose sight of the fact that wire wheels count as a large factor in general car economy as well. By virtue of their inherent qualities of lightness and resiliency they protect and preserve the vital mechanism and lengthen its natural active life.

Every one knows the effect of a fly-wheel—the fly-wheel always has a heavy rim to give it great inertia.

Properly constructed wire wheels are not cheap—they bespeak quality and refinement and add to the appearance of the car. What is more graceful, more harmonious, more in keeping with the spirit and artistic refinement of modern car design than the setting given it by well-proportioned wire-wheel equipment?

Detroit to Have Show Building

Detroit is to have an exhibition building and to local automobile dealers, especially to C. C. Starkweather, formerly president of the Detroit Automobile Dealers' Association, most of the credit is due for the success in launching the organization.

Upon property facing 205 feet on Woodward and Cass avenues and 450 feet on Antoinette street, there will be erected an auditorium and convention hall 165 by 330 feet. The hall will have a seating capacity for at least 24,000 people and it is expected that the next Detroit automobile show will be held in it.

The organization is known under the name of Merchants' and Manufacturers' Auditorium and will be incorporated. C. C. Starkweather is president; Walter Wilmot, who has been in charge of the local automobile shows for many years, is vice-president and general manager; W. J. Gordon, president of the Gordon Auto Sales Company is treasurer, and H. C. Bulkley, of Campbell, Bulkley & Ledyard, is secretary.

On the street frontages the building is to be two stories high, 60 feet deep on Woodward and Cass avenues and 40 feet deep on Antoinette, this for the purpose of providing a number of stores or show rooms 20 feet wide for automobile supply dealers and manufacturer's agents or automobile dealers.

The interior of the exhibition hall will have two mezzanine balconies which may be used at show time for parts and accessory exhibits and which ordinarily will provide space for manufacturer's agents and others.

Work on the new building is to be started within 30 days and it is expected that it will be ready by January 1.

The Electric as a Current Consuming Device*

Results of Electric Vehicle Operator in foreign Countries

THE limitations of distance and speed are at first sight serious objections to the electromobile; but there are many cases in which these objections are of no importance. As touring cars it is hardly likely they will ever have any great vogue; but there are many industrial purposes of a local character, such as the conveyance of goods, the watering of the streets and many other functions of municipal activity, that might be instanced as a likely field of operation. Thus, in many places they are used in the work of the fire brigade; there are 134 wagons of this kind in use in Germany, fifty of which are in Berlin and another fifty in Vienna. Sixty wagons are used in Berlin of the electric type for watering the streets. The German postoffice uses electrically-driven tricycles for the postmen who empty the letter boxes, and for other kinds of postal traffic. In Berlin the postoffice has eighty-three heavy wagons and seventy-one electric tricycles; in Leipsic there are thirty vehicles similarly employed, and thirteen in Bavaria, while in Vienna there are thirty such vehicles used in postal work, and in Copenhagen twelve. A table is given showing the number of electrics in the different countries of Europe, from which it appears that Germany has 1,691, while Austria, France, England and Switzerland have each of them between 200 and 300, and the other countries of Europe, with the exception of Holland, which has 115, scarcely use them at all.

BY DR. H. BECKMAN have cabs, omnibuses, trade carts, postal vans or any such things to adopt the system of electric traction.

The electric vehicle has certain well-known advantages; it is unnecessary at the moment to go into that question. But it is quite certain that if it is to have a more extended field of operation that can only be done with the co-operation and encouragement of the central station. Of course, the central stations would themselves benefit by such co-operation, as the following remarks are intended to prove. Each electric that requires to be charged is a new customer, and a very useful one. An electric truck, used for industrial purposes, is cheaper in running expenses by something between 10 and 25 per cent than the gas type van, the precise figure depending on local conditions; yet, notwithstanding this, the current consumed by such a wagon in the course of a steady year's work is quite considerable. Let us suppose that a trade wagon covers 15,000 km. (kilometer = 1.621 miles) in the year and a cab 40,000 km. The following figures will show the result of experience in Berlin. A so-called Bef wagon (*i. e.*, one made by the Berlin Electromobile Factory), taking a load of 8 cwt., requires from 0.18 to 0.2 kwhrs. per kilometre covered; its yearly consumption will, therefore, be about 3,000 kwhrs. A cab, taking a load of the ordinary kind, requires 0.4 kwhr. per kilometre, or a yearly consumption of 16,000 kwhrs. A one-ton wagon requires 0.35 kwhrs. per kilometre, and has a yearly consumption of 5,250 kwhrs. And so on until we find a five-ton wagon, taking 1 kwhr. per kilometre, consumes 15,000 kwhrs. annually. If these consumptions are translated into lamps, or rather into the yearly consumption of lamps, we see that a five-ton wagon takes as much as 1,100 metal filaments of 25 c.p. This shows the load that would result in any place if it were possible by local suasion to induce the people who

A fair instance can be found in the central station at Neumarkt, in Saxony, which is quite a small place. Here for the last five years four electric omnibuses have been plying between the railway station and the town over a distance of two and one-half miles. The current required amounts to 40,000 kwhrs. a year. Seeing that the whole output of the station is only 260,000 kwhrs., it is evident how important this traffic in electric omnibuses is. The load, moreover, as is well known, is unusually acceptable, inasmuch as it can be dealt with at times of light load. And, if there were a number of these charging stations on the circuits of a central station, it is plain that the average load factor would be much improved. Take, again, the case of the charging stations in Berlin, which are used for this electromobile work, and which are probably the largest of their kind in the world. In one of these the batteries belonging to 215 cabs and other vehicles are charged. Polyphase current at 6,000 volts is received from the Berlin network. This current is transformed to 120 volts, and then passed through rotary converters, three of which have a capacity of 120 kw. and another gives 440 kw. All these rotaries work on one set of 'bus bars, to which the batteries are connected in whatever state of charge they happen to be. The charging proceeds at variable voltage till gas begins to be given off, the current being kept constant; the current taken depends on the times available for charging and on the state of the batteries. As soon as the batteries begin to give off the gas the current is gradually diminished. The author gives some curves relating to the output of this station. The charging appears to be done between 7:30 A. M. and 3 P. M. and between 8 P. M. and 4 A. M.—at least these are the hours in winter. There is also a diagram showing the switchboard connections at this station, with notes which enable one to understand the method of working. The load spreads itself very evenly over a number of hours in the day. Thus, at this station in Berlin, charging proceeds through 5,600 hours in the year. It would probably be difficult to find any other kind of demand for current that can spread over the times of light load so evenly and with such regularity from day to day. Neither is there any reason why this kind of work should not be capable of being undertaken by any central station, provided the district in which it is situated is not too hilly. The only necessary preliminary is to persuade users that this form of traction is economical, a fact which is quite capable of demonstration. In Greater Berlin there are altogether twelve public charging stations, and three charging stations used exclusively for postal vans. Of course, some of these stations are much smaller than others, and the one above mentioned is the largest of the lot. Nevertheless, the total amount of energy that is used in Berlin for charging electric vehicles is very considerable, and amounts, according to a reliable estimate, to about 10,000,000 kwhrs. annually. If the price is put down at about one-half cent per unit, we see that an income of about \$200,000 is derived from this source. This in-

*Abstract of an article in the *Elektrotechnische Zeitung*.

come is derived from the charging of 840 electromobiles that work in the city.

In the United States a great deal of progress has also been made. Here it is said that there are in all 50,000 electric wagons of different kinds, including cabs. Naturally this is regarded as a satisfactory start, and the hopes that are expressed in competent circles may be judged from the fact that Steinmetz is reported to have said that he hoped in 10 years there would be 10 million electric vehicles on the Continent of America. Thus a great future is thought to be in prospect for this class of work; but it must not be forgotten that everything depends on the co-operation of the electrical interests and on the price at which the charging can be done. Not only must the consumer be supplied at a reasonable rate, but the central stations ought to be content with a reasonable profit. The extra costs incurred by the central stations for this class of output mainly resolve themselves into the cost of coal, water and perhaps something for attendance. There is little in the way of indirect charges that ought to be reckoned in, and little is likely to be done in the way of expenditure for special plant. There is perhaps, also, the further argument in favor of the electromobile that it makes the consumer independent of petrol and its very fluctuating price. The money spent on petrol goes largely out of the country, though if this aspect of the question were to be followed up in our columns it might bring us within the sphere of contentious political problems. It is better, perhaps, to say nothing further about this argument, but to leave it to those to expound to whom it may seem to appeal with force. It is, however, a fact that gas is a commodity the price of which has varied a good deal in the past, and there seems to be good reason to suppose that its price is likely to go up rather than to go down.

Cross Country Trucking

Westchester County, N. Y., has never been regarded as an especially desirable field for electric truck operation. Heavy hills and insufficient charging facilities have militated against this form of road transportation. All of which makes more interesting the recent performance of one of the veteran five-ton machines of the New York Edison Company.

This truck left New York at midnight on March 3 for Tarrytown. An eighty-four-foot steel smoke-stack in seven sections, building tackle weighing about a ton and a construction crew made up the load. Tarrytown was reached the next day at noon after a stop at Yonkers. The load was discharged and the truck was used as a hoisting engine in erecting the stack (a two days' task), after which the return trip to New York by way of Yonkers was started.

The twenty-nine-mile round trip between Yonkers and Tarrytown, as well as the hoisting of the sections of stack by means of the truck's electric winch equipment, was all performed on the one charge of the battery. Boosts, however, were taken at Yonkers on the way out and again on the way back.

The trip was not undertaken without considerable preparation. To begin with, the load was twelve feet wide. This meant that the traffic police of Yonkers had to be warned of its coming so that the streets could be kept clear. The truck was stopped every time a trolley car approached, for in many cases there was a clearance of barely twelve inches. The height made it necessary to raise overhead wire when trolley lines were crossed.

The chauffeur's log of the trip contains some interesting figures. It shows that the 14.6 mile run to Yonkers was made in three hours and that 233 ampere hours of current were used. From Yonkers to Tarrytown, 11.1 miles, covered in two and three-quarters hours, 172 ampere hours were used, while twelve ampere hours were required for hoisting the stack at the power house of the Westchester Lighting Company. The load consisted of seven sections of stack three feet eight inches in diameter, having a total length of eighty-four feet. The stack itself weighed about four tons while the rigging added another ton. Then, too, there was the better part of a ton of live weight, for the construction gang huskies were passengers on the trip.

This truck, No. 702, is one of the oldest in active operation in New York. It was built by the Vehicle Equipment Company (now the General Vehicle Co.) and has been in the service of the Edison Company for twelve years.

Further evidence of the widening field of electric truck operation is seen in the still more recent performance of two New York vans which delivered eight loads of household goods at Tarrytown. The start was from Ninety-sixth street and Riverside drive, making the distance for each trip fifty miles.

Of course, a trip of that distance through the city is easily within the capacity of a battery-driven truck. Such journeys into the suburbs, however, where hills and oftentimes muddy roads prevail have been considered as a little bit beyond the ability of the electric.

The two vehicles in question are operated by the West End Storage Warehouse. A recent contract required that eight loads of furniture be moved from a Riverside Drive apartment to a place just this side of Tarrytown. Ordinarily the job would not have been undertaken with electric trucks. Mr. Grant Wayne, manager of the company, however, knew that with a battery boost at some stage of the journey there would be no question as to the outcome. Inquiry showed that facilities for such boosting were provided by the Yonkers E. L. & P. Co.

Subsequent to the Tarrytown journey one of the vehicles made a round trip of forty-six miles to Rockville Centre, L. I., without boosting.

Two Garage Rentals from Every Space

Garages in the downtown section of Cleveland are run under forced draft; nearly every car space is made to do double duty; by night it houses one car and by day another, and thus two rentals are obtained for the one space. Business men, shoppers and daytime visitors to the city store their cars in these garages during the day, and at night the cars of residents and tourists take up this space.

The charge for space varies according to the time, and the following scale of prices is typical, these being in vogue at the Euclid Square Garage, the largest in the city:

HOURLY STORAGE SERVICE	
Any part of 5 hours.....	\$0.25
5 hours to 10 hours.....	.50
10 hours to 15 hours.....	.75
15 hours to 24 hours.....	1.00
MONTHLY STORAGE.	
Day time	\$6.00
Night time	6.00
Day and night.....	10.00
WASHING AND POLISHING.	
Per car	\$1.50

Motor Vehicle Regulation

Incompleteness of Motor Car Legislation and Defects in Existing Laws

BY F. M. HUGO*

THE legislature is never at its best when legislating with regard to new inventions and for the altered conditions to which they have given rise. As regards the motor car, so far no legislature has succeeded in passing any very complete automobile laws. Habits and customs, men and machinery have not had time to adjust themselves to the new conditions, and, just as the first laws which concerned railways, telegraphs, telephones and electric cars were ridiculous from a practical and scientific point of view, so now it is hardly to be expected that a body consisting mainly of persons who are unable to study the problem fully or dispassionately can make good laws, especially when extreme opinions are mostly in evidence. It may be well, therefore, to try to indicate the most important defects in the existing laws and suggest possible remedies.

To begin with, all motor legislation should aim at giving power to curb driving to the common danger. This can be attained by means of strict enforcement of a speed limit, or, best of all, by means of evidence based upon the opinion of trustworthy witnesses of the danger caused.

For nine years, from 1901 to 1910, no maximum speed limit existed, and it was not until 1910 when the motor car act which at present governs the use of the automobile was passed and came into operation. Although the act of 1910 was passed in haste at the end of a long session of the legislature, its defects are not as great as might have been the case had not a well-organized and enthusiastic band of motorists in the legislature fought the bill section by section and secured considerable concessions.

Greater stress was laid in the original draft on dangerous driving than on speed, for the original scheme contained no speed limit at all. In deference, however, to a numerically strong body of anti-motorist sentiment, a speed limit of thirty miles an hour was inserted, allowing incorporated cities and villages to reduce this to fifteen miles an hour. But ever since that time the police of many of the cities have concentrated their attention on section 288 of the law, which permits localities to limit the rate of speed under certain conditions, and also on the collection of the resultant fines. These, under the law, belong to the state, but unfortunately they have been withheld in approximately one-half of the counties in the United States. Thus the police traps came into action, and really no serious endeavor has been made to catch the "scorcher" who rounds dangerous corners in a reckless manner or endangers the lives of the public at the cross-roads.

The act of 1910 has been inadequate not because of its own fault, but because the police, being human, have realized that they can obtain convictions more easily for breach of the speed limit than for dangerous driving, which entails trouble and organization to combat. In considering the question of new legislation the natural question to be asked first is, "Is the present law adequate to deal with existing evils, and, if it is, is the demand of public opinion for an alteration of

the law a sufficient reason why new legislation should be introduced?"

The real reason, as has already been pointed out, lies in the mistaken action of the police, who concentrate their efforts almost entirely on short distance "traps" generally 220 yards in length, instead of trying to prevent breaches of the law and danger to the public. Moreover, as regards new legislation, it is certain that in a few years the legislature will be able to gauge the position better; and any alterations in the present law should, therefore, be made with great caution.

But if the legislature's hands are forced and they are compelled to bring in a new bill dealing with the regulation of motor traffic, it is first of all desirable that the bill should regulate not only motor traffic but all traffic. As a matter of fact, the lives of road users are often endangered by horse-drawn as well as by motor-driven vehicles. Moreover, slow traffic is habitually driven on the wrong side of the road, and thus frequently becomes a source of danger, not only to other traffic meeting it and passing, but to third parties whose lives may be endangered by the faster vehicle's having to perform difficult evolutions in order to avoid an accident which otherwise would be caused by the neglect of the slower vehicle.

Next the new law should certainly make it easier for considerate drivers to avoid the meshes of what are called police traps, while, on the other hand, the law should be reinforced as against the inconsiderate and dangerous driver. Thirdly, a reduction in populous places should be made in the general speed limit, and an extension of it on safe and open roads may, on the other hand, be reasonably conceded.

The uses of instruments or signals of warning other than the horn also require regulation. The nuisance of the open exhaust and smoke fumes arising from excessive lubrication of gasoline cars might be similarly dealt with, and these quite unnecessary defects in construction should be made illegal. It has also been suggested that some mechanical contrivance plainly indicating to a spectator the speed at which a car is going should be made compulsory. But it need hardly be pointed out that if such an invention were produced it is not likely to be immune from the fate of all delicate mechanical contrivances of this kind—the liability to get out of order; and when out of order, either in the direction of showing too great or too little speed, a misleading dial would lead to undesirable misunderstandings and in most cases to injustice and friction.

As regards the speed limit, for many years past motorists as a body have demanded the total abolition of the speed limit, but we are not altogether convinced that this would be wise in the present state of public opinion, the condition of the roads and the average standard of driving. Possibly an extension of the fifteen and thirty-mile limits on open roads would be reasonable as a limit at present, with special speed limits as mentioned before through populous places.

It is interesting, in this connection, to observe that

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there is a growing body of experienced motoring opinion which is averse to the total abolition of the speed limit at present. Habitually high speeds are becoming less important than formerly, economy and comfort of the vehicle having taken a higher place than mere rapidity. The greatest drawbacks to a speed

limit of any kind is that it encourages the police to neglect the point of view of the public safety. The legislator will doubtless be careful that, in framing new restrictions against the small minority who abuse their motor cars, he does not deal a severe blow to a great industry.

Purchasing And Advertising

Increasing Efficiency in Purchasing and a Few Suggestions on Salesmanship

Influence of Purchasing on Profits

THE relation between the cost of raw material which enters into a manufactured article and the profit derived from the sale of the article is direct, positive and easily calculable. There are some aspects of this relation which deserve consideration, more particularly the influence which purchasing has on profits.

The profits of any concern are absolutely and undoubtedly increased to an appreciable extent by the ability of the purchasing agent to buy the right materials for the lowest price in correct quantities for delivery at the proper time.

Owing to the complexity and interdependence of manufacturing industries, the finished product of one manufacturer may be the raw material of another. For this reason there is a wide variation in the percentage which the cost of raw material bears to the selling price.

The selling price of any manufactured article is arrived at by the cumulative advances which follow as a natural sequence on the initial outlay. This initial outlay is for the acquisition of raw materials and as an illustration the conditions actually existing in a manufacturing establishment will be taken to exemplify the argument. This instance came under the attention of the writer and although no two industries may show the same results as given here, nevertheless, the argument loses none of its force.

Raw material	32%
Labor	19
Indirect expense	22
Selling expense	11
Profit	16

Selling price100%

These are the main divisions by which the selling price is reached. They could be subdivided into many minor items, but for the present purpose the above will suffice. The activities of each division of an organization are called upon at some stage of the progress of an article through the manufacturing process until its final delivery to the customer; but the function first exercised is that of purchasing, and on its efficient control and proper methods important consequences are involved.

Referring to the schedule of percentages given above, even if only a small saving can be effected in purchasing raw materials it is desired to emphasize the influence this has on profits. Assuming that better purchasing methods reduce the cost of raw material 6%, from 32% to 30%, the 2% of selling price saved has a direct bearing on the profit, which would then be 18%, or equivalent to an increase of 12½%. An

increase of 12½% in profits of manufacturing establishment would be welcomed and appreciated, and as this would be accomplished solely through the efforts of the purchasing department, the credit belongs to that department and its importance and standing is correspondingly increased.

Purchasing of raw material only has been considered, but the activities of the purchasing department cover many items included in indirect expense, such as supplies.

It is not the purpose of this paper to discuss the means and methods by which these savings can be realized. Probably no purchasing department is operated at a state of perfection where one can say that nothing more can be done in achieving additional economies and savings. If a purchasing agent knows what relation his purchases bear to the finished product, and the stages by which it reaches its selling price, an incentive is given him to perfect his organization and bring into effect the results which will so largely influence the profits of any establishment.

An increase in the profits of any concern is always most gratifying and constant efforts to reduce costs are made by executives. Reduction of labor costs are frequently accompanied by a considerable increase in overhead charges, but the savings brought about by more efficient purchasing can almost invariably be accomplished without additional expense. In those cases where additional expense is incurred it is usually infinitesimal when compared with the benefits derived and results achieved.

A Few Suggestions for Increasing Sales

IN ANY field of human endeavor, good, hard, earnest and intelligent plugging is a sure road to success. The greater the number of calls per day, the greater the number of orders. Nor is there any successful short cut or scientific scheme which will supplant the personal call. Your voice over the telephone is not half as convincing as when you meet the prospective face to face. Personality counts for much in the power of persuasion, and a telephone receiver always can be hung up.

When a salesman gets into a town, ordinarily he should clean it up from Main street and Cross street to the city limits—and he should not discriminate against the dealer who is just outside of the limits, either. Usually it is best to call on every dealer in your line whether you think you can sell him or not. Those that you do sell are your bread and butter; those that you hope to sell are your future investment. You can use the spare time between trains in becoming acquainted with possible customers who may be re-

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ceptive to an argument. To leave a good impression, tell your stories straight and don't overstay. Be a Republican, Democrat, pro-German, pro-Allies, or what you will, but keep such personal matters as much as possible from your customers. As a general thing at best, they only pretend politely to be interested. At worst, they may be antagonized.

A stern rule of salesmanship, as well as an inflexible rule of the house, should be one set of prices to one class of trade, provided the same conditions of quantity and so forth prevail. Otherwise, the fellow who enjoys the better price will be unable to keep it to himself, and you will become unpopular with those against whom you discriminated. Also you will have to tell lies and do extra bookkeeping, to keep from getting your wires crossed.

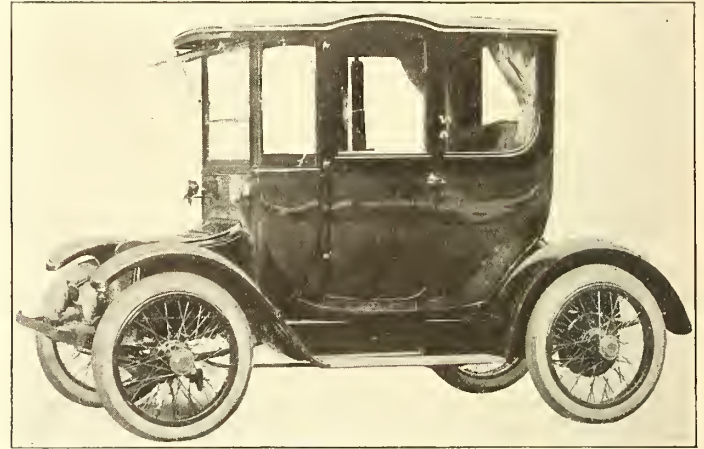
The successful salesman always is trying for new records. He never is satisfied, but he never "kicks," and therein lies the difference between him and the man who is always kicking about everything else, but is well satisfied with himself. Contrasted with him, the successful salesman is his own biggest competitor—and he usually succeeds in beating himself.

Being systematic will help a salesman almost as much as being energetic. Demand that a salesman keep his own books, that he compare one day's business with another's and find out why one is smaller, and that, in making the comparison, he take into account the number of hours worked and the number of calls made. Encourage him always to try to do better, but don't, in criticising, discourage. Cheerfulness, rightly stimulated, is the forerunner of success.

A record of customers and prospective customers in each locality should be kept. Bringing this up to date should be the salesman's duty after his day's selling work is done. Assimilate your day's experience as you make your records, and let the result pass in mental review. Be ready for the next day, with the same energy, plus the experience of the day before. Be genuinely interested in your work. Bring it up to

as some would have it. You then are combining work with pleasure—going to life's college and getting paid for it.

A very important matter in its effect upon economy of time as well as upon expense, is proper routing



Chicago Electric Model Sold With or Without Battery.

of a salesman's trips. A loose system of long "jumps" and short calls runs up railroad mileage and uses up time, without turning in anything like the volume of business that can be had in the same period and at the same cost by a well-planned, systematic and exhaustive method of consecutively cleaning up one locality after another, passing upon the way no customer who requires attention.

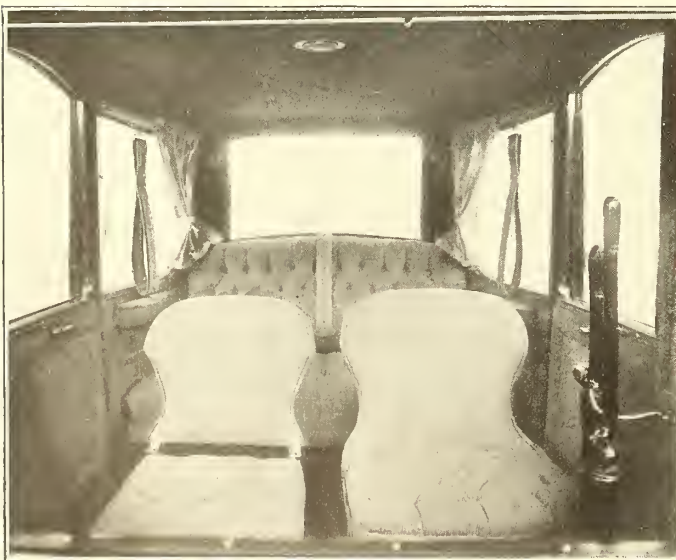
For the salesman who is mentally alert, with eyes and mind open, and everlastingly active, there are innumerable opportunities for the creation of new business. Just as new products can be found for old uses, so can new uses be found for old products. Indeed, the stress of modern competition, instead of narrowing opportunity and exhausting fields of activity, as so many think it does, in reality tends to multiply the outlets for merchandise.

British Truck Subsidy Has Eye to Peace Type

National preparedness as a subject is one of the most engrossing that is before the American public today. There is one element of the question that, seemingly, has been given a small share of attention—that of motor truck subsidies. It was through the policy of giving subsidies that France, Germany, and Austria, and, to a certain extent, England were enabled to gather great fleets of motor trucks together at the outbreak of the European war.

Just before the start of hostilities the British War Department drew up subsidy regulations that were the result of a number of years' experience. In a recent number of *The Engineer*, a recognized British authority on engineering matters, the first truck to conform to the subsidy regulations was described. As a preface to this description a résumé of the conditions imposed by the war department was given. The article says:

In all matters relating to military transport the military point of view must take precedence for the moment, but peace will come sooner or later, and with it presumably a somewhat sudden cessation in the demand for military supplies and a period of anxiety on the part of manufacturers of lorries, among other things, as to the disposal of an output swelled, as it will have been, by the present abnormal and insatiable requirements of war. Terrible difficulties would



Interior Seating Arrangement of Chicago Electric Coupe.

a higher plane; make it educational as well as profitable. Take advantage of your wonderful opportunity to see and talk to different people in different places. Take advantage of the opportunity to come in personal contact with real, every-day life as it really is and not

arise if the vehicles which now have to be built to meet service requirements were inherently unsuitable for other than military purposes.

This is a point to which the mechanical transport committee gave very full consideration when drawing up the regulations governing its subsidy scheme for times of peace and which apply, we believe, to all vehicles now being constructed for the war office. It will be remembered that the object of the scheme was to put the government, on the outbreak of war, not then foreseen, in possession of an adequate number of mechanical transport vehicles of a more or less standard pattern, without involving the taxpayer in enormous expenses by the direct purchase of large fleets which would have been comparatively idle during peace time. With these considerations in mind the committee drew up a subsidy scheme, which was put into final form last year.

Under it, if the civilian owner of a truck agrees to have embodied in the construction of his vehicle certain features, which are desirable from a military standpoint but which in no wise interfere with its utility for commercial purposes, and allows the vehicle to be inspected every six months by an official of the war office, he not only obtains grants, amounting in all to from \$550 to \$600, but on the outbreak of a war is paid a pre-arranged price for his lorry. Thus, not only is the owner assured of a fair—even generous—price, but he obtains a report every six months to show that his vehicles are being properly looked after and driven by his staff.

A careful study of the regulations indicates that in only one essential feature of design is the liberty of the designer interfered with—a chain drive is barred on any vehicle which is to earn the subsidy. The reason for this is a military one. In active service the work which the lorry has to do is very severe on wheels and tires, and the wheels must therefore be able to be removed and replaced in the least possible time. In a gear-driven vehicle the wheel may be taken off by the removal of a few nuts. It is equally simple to replace it.

This does not matter in the least to the owner; in fact, he gains the same advantages as the military man does, though they may not be of quite the same value to him. The worst that he has to suffer is the sacrifice of some personal predilection in favor of the chain, derived perhaps from lengthy and satisfactory experience with this form of drive. The insistence on a gear drive is the only really important point in the contrast of a subsidy lorry which may fail to commend itself to the civilian owner unless he attaches more importance to a low platform than to the advantages of a large wheel diameter and ample ground clearance. Altogether, then, it will be seen that the civilian owner has everything to gain and nothing to lose by buying a vehicle built to earn the subsidy, and there is no hidden trap behind the excellent bargain that is offered him.

Electric Trucks Economical Under Low Daily Mileage

According to the experience of the Duquesne Light Company, Pittsburgh, Pa., electric trucks have proved especially desirable in central-station service where the daily mileage traveled is small. The trucks employed by the Duquesne company are required to traverse less than 16 miles per day per truck, which is equivalent to about 4,000 miles a year. This condition makes the item of fixed charges an important factor when compared with the cost of hiring vehicles.

The accompanying table shows the cost of operating trucks for the distribution department of the Pittsburgh company. The operating cost includes repairs and improvements in equipment. The fixed charges are based on 12 per cent for electric vehicles and 18 per cent for gasoline trucks. Comparison of the total expenses shows an advantage for electric vehicles over horse-drawn or gas-driven trucks, especially when the vehicles are garaged by the company. In one district the average cost of hiring wagons was \$375 a month as compared with \$137 when one electric truck was placed in service. The truck gave about the same service as one and one-half wagons at \$160 a month each. The saving was therefore the difference between \$238

and \$31 (the monthly cost of operating the truck), or \$207 a month. Because of the higher speed attained with these vehicles it was also found that the gang could do 27 per cent more work, so that \$4.05 per day was saved on wages.

Aside from its usefulness as a dependable means of locomotion, the electric truck, unlike any other kind of vehicle, is itself a sort of perambulating power plant or portable source of electrical energy, which can be drawn upon for the operation of electrically driven devices of almost any kind. Physicians, for example, have found their electric phaetons particularly useful when called upon to make X-ray diagnoses in the homes of patients where electric service is not available. By running a pair of wires to the battery of the vehicle standing at the curb, the doctor's portable X-ray machine can be operated as conveniently as if connected directly to the central-station circuits.

COST OF OPERATING TRUCKS.

Truck—	Cost per Day		Total	Remarks
	Operating	Fixed charges		
Gasoline	\$3.66	\$1.67	\$5.33	Garaged by company
Gasoline	3.09	1.60	5.50	Garaged by company
Gasoline	2.06	.90	2.96	Rented
Electric	4.71	.29	5.00	Thirteen years old, rented
Electric	3.24	1.15	4.39	Rented
Electric .....	.96	1.00	1.96	Garaged by company
Electric	2.00	.89	2.89	Rented
Electric	1.76	.89	2.65	Rented
Electric	1.13	.89	2.02	Garaged by company
Electric .....	.71	.89	1.60	Garaged by company
Electric .....	.69	.89	1.58	Garaged by company

Costs per mile: Gasoline trucks, 26 cents; electric trucks, 22 cents; hired team, 80 cents. Drivers' wages for only two hours a day are charged to operation, since the driver works in the gang while the truck is standing.

Expert Discusses Goodrich Tire

The wireless truck tire department of the B. F. Goodrich Company has made public results of an extensive investigation it has recently concluded on the problem of getting greater tire mileage out of solid tires through the proper selection of sizes and types.

S. V. Norton, sales manager for the Goodrich wireless truck tires, made the following interesting statements:

"Momentary overloading of solid truck tires, which ruptures the rubber by displacing it beyond the limits of its ability to recuperate is the cause for more tire failures than probably any other factor.

"Momentary overload means excessive strain or shock on the tire at certain points caused by the tire being forced to bear, in one way or another, more weight for an instant than it is intended to withstand.

"This results in abnormal displacement and the creation of undue internal friction and heating which is not quickly radiated. The tire is damaged beyond repair and the injury will surely make itself known.

"In small duals, those made up of less than four-inch units, neither tire is in itself large enough to withstand the momentary loads and shocks encountered when, for example, the road is uneven and one tire is touching ground while the other is suspended slightly above the road surface. Crowned roads are another

instance. The curve of the surface forces the inner tire to bear more weight than the outer.

"The result is that when these loads are alternately and momentarily shifted from one small tire to the other, the individual unit is ruptured on account of its very small size, and, therefore, fails much sooner than it would if both tires of the unit were always carrying their equal share of the load.

"The five and six-inch single unit is the better choice over the three-inch and three and a half-inch dual, for the load on that side is evenly borne by the single. We do not, however, recommend that single tires of greater width than seven inches be used. It is necessary, as in all things, to adhere to the happy medium.

"In singles larger than seven inches, the displacement, due to load, takes place in such direction that it causes undue internal friction and heating which is not readily radiated when the unit is too large, and four, five and six-inch duals are better in practice than large singles designed for equivalent service, for their size is usually ample to withstand momentary overloading yet not too bulky to prevent proper radiation.

"It is the opinion of the Goodrich company that dual tires cannot possibly have a greater carrying capacity than twice that of a single tire of which it is composed."

Enormous Exports of Automobile Trucks

Since last October the value of gasoline automobile trucks exported to Europe has jumped by leaps and bounds. Few in the electrical industry realize the enormity of the export business resulting from the war, and electric-vehicle manufacturers view with not a little apprehension the increasing activities of gasoline-truck manufacturers. What the effect of this greatly augmented production will be on the home market after the war is hard to foretell, although very keen competition between gasoline and electric truck manufacturers for whatever business presents itself is predicted.

About 55 per cent of manufactures exported from the United States goes from the port of New York, and the foreign-trade department of the National City Bank shows in its record the extent of the export trade leaving New York. The value of automobile trucks, excluding passenger cars, exported during the nine months beginning with last October, compared with the previous year, is given in the table herewith. The great majority of these trucks went to France and England.

No records are available as to the value of trucks exported through other ports, but at the present rate the port of New York alone will show about \$60,000,000 for the year. If that represents only 55 per cent of the total exported, the gasoline-truck manufacturers have managed to sell over \$125,000,000 worth of goods to the European nations thus far. However, it is more than probable that most of the business cleared from

COMMERCIAL VEHICLES EXPORTED FROM PORT OF NEW YORK.

Month—	1913-14	1914-15
October	\$129,506	\$ 2,286,964
November	105,501	2,244,518
December	100,660	3,387,729
January	74,491	2,545,527
February	83,461	3,022,482
March	63,932	4,725,563
April	72,676	5,240,481
May	127,024	6,583,912
June	120,257	8,578,802
Total	\$877,508	\$38,615,978

the port of New York, and that the export business in

gasoline trucks for the year is nearer \$75,000,000 than \$125,000,000.

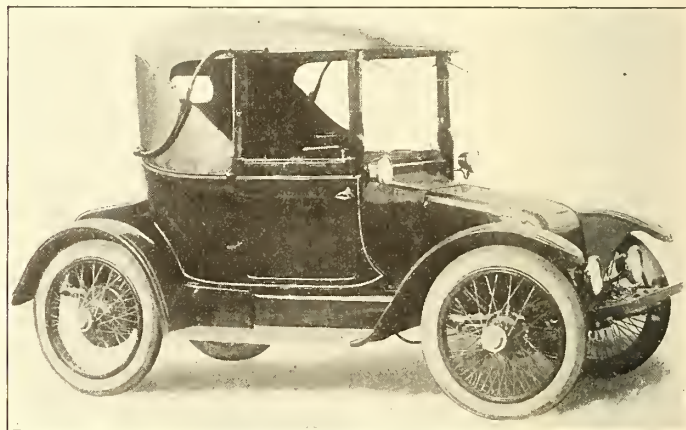
Changed Tactics Landed Sale

A certain salesman had made several calls on a man with whom he could not arrange an interview. Every time the salesman went to see him he would be told the man was "out" or busy or not interested; yet he knew this man was going to buy a car, for he had been seriously considering a rival make; in fact, from the man's attitude it appeared that he had made up his mind to buy one of these cars.

Finally the salesman decided that the only way to get to the prospect was to say he had nothing to sell, so without giving his name he managed to be ushered into the prospect's inner sanctum.

The prospect looked up after a while in surprise, and exclaimed, "What! You here?" The prospect kept on working, and meanwhile the salesman explained:

"I came to you today to do you a favor. I want you to take a ride in our car; to get in behind the wheel and drive it. That is all."



Electric Cabriolet, a Man's Car.

Apparently unimpressed, the prospect's cheerful rejoinder to this was, "Won't you go?" But the salesman replied that he would stay until he made an appointment for a demonstration.

After a pause the prospect said, "Do you want a job?" The offer was declined. This question indicated, however, that his persistency had made a favorable impression on the prospect so he ended the interview by saying that he would be at the prospect's house at 11 a. m. the following Sunday to give a demonstration.

No reply was forthcoming from the prospect, but the salesman was there, the demonstration was given and the contract signed by 11:30.

Advertises for Electric Truck

Commissioner Bass of Chattanooga, Tenn., is advertising for bids on furnishing the city department of streets and sewers with a large automobile truck similar to those now operated by the county road commission. He probably will buy the truck early in the next fiscal year if a favorable price and satisfactory demonstration is submitted. The truck must be capable of drawing the street scarifier, thus serving as motive power, enabling the department to dispense with the use of a steam tractor, and also replace six teams or more for hauling chert.

Price Reduction of Electric Pleasure Vehicles

On August 15 the Anderson Electric Car Company, manufacturer of "Detroit electrics," reduced the prices of cars from \$600 to \$725 each. The company plans to double its output in 1916, and as a result expects to make many economies in all overhead expenses, purchasing, advertising, sales cost and engineering. The savings thus effected, it is thought, will be large enough to warrant the present slash in prices. The company states that the 1916 model is of the same quality as the 1915 car with a few 1916 refinements, no attempt having been made to cheapen the car because of the reduction in price. The highest-priced "Detroit electric" under the new schedule is the five-passenger duplex-drive brougham selling for \$2,275, this car being priced before the cut at \$3,000. The lowest-priced car is the four-passenger brougham at \$1,975, it having been reduced from \$2,600.

The Waverley Company has also made large cuts in the prices of its pleasure cars. Reductions of from \$500 to \$1,000 have already been announced on the selling prices of the latest and highest grade models. Owing to the great demand for machine tools of all kinds brought about by the European war, the Waverley Company has been enabled rapidly to introduce quantity-production methods which it had devised several months before the outbreak of the war. The changes which are now being made at the factory will result in further lowering prices for the company's vehicles.

Prices have not been lowered on either the Rauch & Lang "electrics" or the Baker "electrics." At the New York offices of the Baker, Rauch & Lang Company it was stated that the company did not feel able to reduce the price of the cars and still maintain the quality of its products. The output of the company is in the neighborhood of about 1,000 cars a year, and it was stated that unless the output could be increased to the neighborhood of 10,000 cars a year the decreased cost per car due to the manufacture of a larger number of cars would not be sufficient to warrant any appreciable price reduction. Even were the output increased to 10,000 cars, it is not thought that the reduction would amount to more than a couple of hundred dollars.

When asked as to the effect of the war on the sale of pleasure "electrics," the representative in charge stated that the sales had fallen off to a certain extent owing to this cause, but that in the fall the company expected materially to increase its sales, and it was looking forward to decidedly better conditions. It was pointed out that the purchasers of both the Baker "electric" and the Rauch & Lang "electric" were people of conservative character, quick to retrench.

Electric Progress in England

England is ever ready to adopt improvements, and has recently made a new venture by introducing an electric vehicle into municipal service. This takes the form of an electrically-propelled street watering tank wagon supplied by the General Vehicle Co., Ltd., of Imperial House, Kingsway, W. C.

Until recently, the work of watering the roads in Blackpool had been carried out by means of horse-drawn vehicles, which go a long way in a long time, whereas the new sprinkler can water a road 21 feet wide, at a speed of 10 miles per hour, and recently,

on test, distributed 6,000 gallons on 12 miles of road in 2¾ hours. This time included the running to the hydrant and loading, and from these figures, Mr. Bee, cleansing superintendent, Blackpool, estimates that he will be able to replace three or four of the horse-drawn vans. Apart from the great saving which this will mean to Blackpool, a great gain will be made in the expeditious manner in which the work will be carried out, which is highly desirable for a place like Blackpool during the season.

The tank, which has a capacity of 750 gallons, was supplied by Messrs. J. W. Glover & Sons, of Warwick, and is equipped with their patent Warwick sprinkler in the front of the vehicle, which arrangement enables the driver to exercise continual supervision over the spread of the water, and obviates the necessity of looking back.

The chassis itself is of standard G. V. pattern of 3½-ton capacity, fitted with 44-cell 17-plate Ironclad battery, which has an ampere-hour capacity of 268, and gives a range on one charge of 40 miles. It is understood that Mr. Bee, the superintendent, has made arrangements to charge this up at his destructor works.

The chassis frame is constructed of 5-in. channel steel; the motor is a G. E. totally-enclosed type; the controller is of the G. E. type having four speeds forward and two reverse, regulated by field coils. Transmission is by double reduction, first by Morse silent chain enclosed from motor to countershaft, second by roller chains from countershaft to rear wheels. The countershaft is of the housed type on Timken roller bearings with spur gear differential.

The vehicle complete looks smart, and has the usual advantages of the electric, namely, silence and cleanliness.

Suggests Road Rules for Lincoln Highway

Evidently the road rules in the Everglade state are not favorable to the motorist. At least the tourist who sent in the following suggestions to the Lincoln Highway Association as rules of the road to be observed by the thousands of transcontinental tourists of this summer, has had some bitter recollections.

Upon close inspection it will be seen that a gentle vein of satire pervades the suggested list. The motorist says that they are the general rules which must be observed about Jacksonville, and, if they are successful and popular there, why not along the Lincoln Highway?

Rule 1—Upon discovering an approaching team, the automobilist must draw to one side of the road and cover up his machine with a tarpaulin painted to correspond with the scenery.

Rule 2—The speed limit on country roads this year will be secret, and the penalty for violation will be \$10 for every mile an offender is caught going in excess of it.

Rule 3—On approaching a corner, the automobilist must stop not less than 100 yards from the turn and the mechanic must be sent ahead to blow a horn, ring a bell, fire a revolver, and send up three rockets at intervals of five minutes.

Rule 4—Automobiles running at night must send up a red rocket every mile and then wait ten minutes for the road to clear. They may then proceed carefully, blowing their horns and shooting Roman candles.

Rule 5—In case a horse will not pass an automobile in spite of the tarpaulin, the automobilist will take the machine apart as rapidly as possible and conceal the parts in the grass.

Those in charge of the Boston Mail Delivery Company's business say that the electric trucks will greatly facilitate the handling of Boston's postal matter.

PERSONAL NOTES.

Announcement is made of one of the most interesting and significant changes in the electric car field of endeavor the row in Chicago has known in a long time. Roy Herrington, general manager of the American Electric Car Company, has resigned his position to become an important factor in the organization of the Anderson Electric Car Company of Detroit, the largest manufacturers of inclosed cars in the world, under the jurisdiction of D. E. Whipple, central district manager. It is understood that Mr. Herrington, who formerly lived in Rockford, Ill., will go to that city as the representative of Manager Whipple, with the title of Rockford branch manager. There has been a distinct trend in the Rockford territory in favor of electric vehicles, and the field is particularly favorable to the combination of the popular expert on electric cars and the Detroit company's output. In getting the services of Mr. Herrington the Detroit manager feels that he is acquiring a big personal asset. Mr. Herrington for a number of years has been a recognized authority in electric car merchandising, both as a Chicago representative of the Argo Electric and subsequently as an executive of the concern which marketed this car as well as the Borland and Broc. Mr. Herrington mastered every detail of his connection with the American Electric Car Company, and when an opportunity for engaging in a wider field of endeavor came to him he followed his resignation with a contract making him a member of the Detroit organization.

"Mr. Herrington is intimately acquainted with its merits and knows the importance of the opportunity that it has to become a wonderfully successful feature of inclosed car selling—the importance of the electric to those seeking luxury and economy of operation not clearly emphasized by the gas car situation. He will have an important mission in the Rockford district, and we know that he will be a factor."

"I have all the confidence in the world in the efficiency of the Detroit organization," said Mr. Herrington. "For years I have conducted competition with it and now feel that it is so overwhelmingly successful that it would be more congenial to be associated with it rather than trying to oppose it. The product is right and it appears to me as the chance to make myself 100 per cent efficient in merchandising. Manager Whipple is a genius in organization and I am glad to be associated with him, and Rockford is an especially good field for my efforts."

The General Vehicle Company has applied for permits for the erection of an additional unit, 200x400, to its Long Island City plant. It is to be one story, brick and concrete, located at Starr avenue, east of Borden avenue.

Harry Moore, who has been with the Columbus Buggy Company for a number of years, has opened the Columbus Electric garage at 165 North Fourth street, Columbus, Ohio. The quarters were formerly occupied by the Evans garage. Mr. Moore will furnish storage and care for electric vehicles exclusively. His firm will repair and recharge storage batteries of all makes. He is also the distributor of General Lead batteries in this territory.

C. E. Lyall, 1805 Main street, Peoria, Ill., has been appointed to represent the Walker balance drive electric truck in that city.

George Cheseheir, of the Waverley Company, has returned to Washington, D. C., after an absence of two months. Mr. Cheseheir will continue to handle the Waverley electric in the interests of the Pollock Car Corporation.

F. P. Sherbondy, chief electrician for S. F. Bowser & Co., Fort Wayne, Ind., for the past five years, has resigned and has assumed the management of the Exide storage battery and service station, South Bend, Ind., now being established.

William Spaulding, Milburn & Walker electric representative, with headquarters at Portland, Ore., has been appointed district manager for the Milburn interests in Oregon, Washington, Idaho and British Columbia.

S. E. Barnwell, formerly sales manager of the truck department of the Kentucky Wagon Manufacturing Company, has been appointed manager of the Louisville office of the Waverley Company, 206 East Broadway. He succeeds K. A. Ridenor.

W. S. Jameson, who has been prominently identified with the merchandising of high grade automobiles in this territory as a member of the sales department of the Beacon Motor Car Company, has gone into business for himself as the distributor for the Baker and Rauch & Lang electrics. He has opened his headquarters at 618 Commonwealth Avenue, where he has abundant space for a salesroom and general offices. He is now exhibiting a complete line of electric vehicles and has made arrangements for a service station at 400 Newbury street under the personal management of Nicholas Rummefanger, an acknowledged expert on the electric vehicle.

Bertram Smith, well known in the storage battery business for the past fifteen years, has been appointed manager of the Detroit office of the Edison Storage Battery Company. About a year and a half ago Mr. Smith joined the Edison interests as assistant manager of the Edison Storage Battery Supply Company of San Francisco, the distributor for the Edison Nickel-Iron-Alkaline Battery on the Pacific Coast. Directly previous to his connection with the Edison Company he was manager of the battery department in the Chicago branch of the United States Light and Heating Company. He was formerly secretary and treasurer of the National Battery Company of Buffalo until its consolidation with the United States Light and Heating Company. In taking up his new duties in Detroit, therefore, he is returning to familiar territory. In order to better serve its customers in eastern Michigan as well as Ohio and adjoining territory, the Edison Storage Battery Company recently moved its Cleveland office to Detroit, where it has located in the new David Whitney building on Woodward avenue. The appointment of Mr. Smith as manager, together with the company's rapidly growing business in this section, is expected to make the Detroit office one of the most important branches.

A. Jackson Marshall, a newcomer in the field, has, in a very short period of time, won for himself a high place in the electric vehicle industry. After several years of successful sales and general promotion work in the lighting field, especially with electricity supply companies, architects, and fixture houses, during which time he extensively wrote and lectured, he was appointed secretary of the Electric Vehicle Association of America in February, 1914, when the association was about four and one-half years old, with a membership of about 500 and two local sections in New England and Chicago.

In a year and one-half, the association has increased its membership to about 1,100 and its sectional representation to 16, located in the following cities: New England, Chicago, Philadelphia, Washington, Cincinnati, San Francisco, Los Angeles, Pittsburgh, New York, Detroit, Cleveland, Toronto, Denver, St. Louis, Kansas City and Portland.

Mr. Marshall recently completed an eight-thousand-mile Pacific Coast trip, during which time he delivered a large number of lectures, organized sections of the association, and studied at first hand distribution methods. He is now busily

Philadelphia

THIN PLATE BATTERIES

"Diamond Grid"

CAPACITY
ECONOMY



LIFE
MILEAGE

*For Pleasure and Commercial Cars.
For Sparking Starting and Lighting*

WRITE FOR CATALOGUE

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DEPOTS AND AGENCIES

NEW YORK BOSTON CHICAGO CLEVELAND
WASHINGTON DENVER ROCHESTER ST. LOUIS DETROIT
BUFFALO SALT LAKE CITY MINNEAPOLIS KANSAS CITY, MO.
CINCINNATI TORONTO SEATTLE PORTLAND, ORE.
OAKLAND SAN FRANCISCO LOS ANGELES SACRAMENTO

Heavy Duty Electrics

"General Vehicle"—of course

Heavy duty G. V. Trucks are used in over 90 lines of business. Some cover 60 miles per day, some but 12 miles. They pay on the longer city runs and they pay also in the mill yard where the hauls are not over 100 yards each. Adapting trucks to the *individual needs of the user* comes only through long experience. "Over 5,000 G. V. Electrics in service" explains why we seldom fail.

The Electric truck is not a competitor of the gasoline truck. Each has its economic field—the Electric for short haul frequent stop work, the gasoline truck for the long hauls with few stops.

In the city where heavy loads and frequent stops must contend with street congestion and waits at warehouses and terminals, the Electric is by far the most efficient, satisfactory and economical truck. Let us prove this to you.

Catalogue on request.

General Vehicle Company, Inc.



Long Island City, N.Y.



New York, Chicago, Boston, Philadelphia

Copyright, 1915



Now \$1715

A year ago \$2600



Now \$1715

A year ago \$2600



Now \$1880

A year ago \$2800

3

Great New Reasons Why You Should Buy a 1916 Chicago Electric

→ **PRICE**

The cost of a Chicago Electric does not now stand in the way of its purchase. We well expect a decided increase in sales because of the remarkable lowering of prices.

→ **UPKEEP**

Batteries are not included in the above prices. You can now rent batteries at a minimum cost per month, covering all battery repairs and upkeep. Those preferring a battery with the car, add \$270 to the prices above.

→ **\$100
PAYMENTS**

The strong financial standing of this Company makes possible our deferred payment plan. A Chicago Electric can now be secured by paying \$500 cash, then \$100 a month until the balance is paid.

THESE lower prices, together with the sustained high quality of the car itself, are our strongest bids for your interest—the most substantial reasons why you should buy this electric, which is setting new standards, making new prices and offering the greatest possibilities to electric car owners.

No radical changes have been made in the 1916 models over those of the past season, but numerous desirable refinements and improvements have been added. For example:

A New Painting Process provides the deepest finish and luster with greater wearing qualities than ever before attained in the art of motor car painting.

A Self-Oiling Steering System adding greatly to the ease of driving—the more extensive use of aluminum throughout the body construction—new designed fenders and many other refinements will be found.

Demonstration Without Obligation

Walker Vehicle Company

Makers of Chicago Electrics and Walker Electric Trucks
FACTORY, 39TH AND WALLACE STS., CHICAGO

CHICAGO SALES
2700 Michigan Avenue
Telephone Calumet 3000

EVANSTON BRANCH
Clark and Benson Avenue
Telephone Evanston 481

ELECTRIC VEHICLES

A MAGAZINE FOR THE ELECTRIC CAR OWNER. \$1.50 PER YEAR. 1253 MONADNOCK BLDG.

Vol. 7

CHICAGO, OCTOBER, 1915

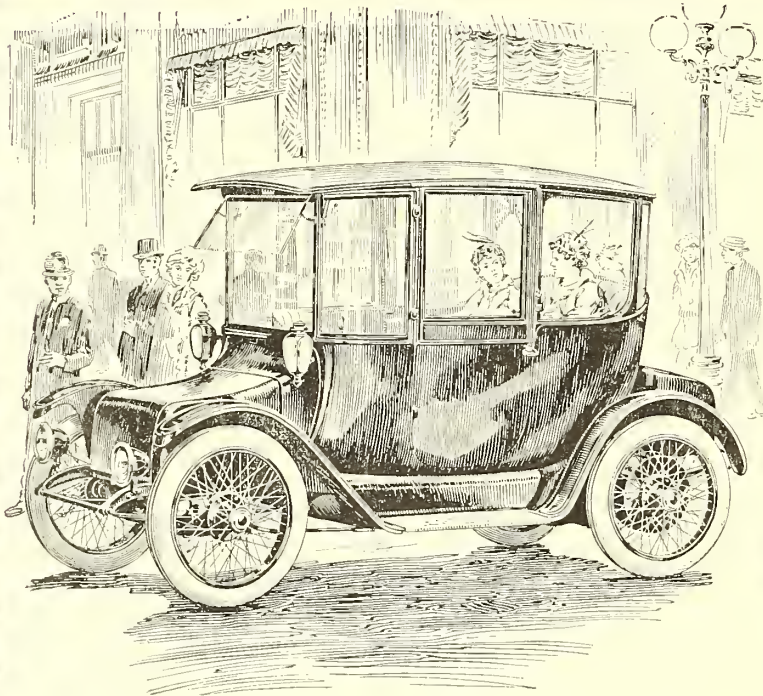
No. 4



1916 DETROIT ELECTRIC, MODEL 59 BROUGHAM

Detroit Electric

\$1975 to \$2275



92%

of all Electric pleasure
cars purchased

IN THE WORLD

during the past

TWO MONTHS

were

Detroit Electrics

WHY?

This is not the result of accident or chance. The purchasing public is *discriminating and intelligent* in judging the relative merits of automobiles. Will you accept the judgment of this *overwhelming evidence* as to the merits and popularity of

The

Detroit Electric?

Increased Efficiency—Hence 15,000—Mile Battery Guarantee
for Chicago Delivery

Anderson Electric Car Company

(Manufacturers Detroit Electrics)

World's Largest Builders of Enclosed Pleasure Cars

2416 Michigan Avenue

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CHICAGO, ILLINOIS

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Volume VII

CHICAGO, OCTOBER, 1915

Number 5

Electric Vehicle Association's Annual Convention

Sixth Meeting of Electric Vehicle Interests Staged at Cleveland, October 18 and 19

THE sixth annual convention of the Electric Vehicle Association of America will be staged at the Statler Hotel, Cleveland, Ohio, October 18 and 19.

In recognition of the great and growing drain on business organizations of the "convention habit," the association has decided to reduce its forthcoming convention at Cleveland to the shortest possible time, so that executives and other busy men having important interests at stake can gather its benefits with a minimum expenditure of time. To this end, the two days' sessions will be run on efficiency lines, and supplementary entertainments, such as form a conspicuous part of so many society gatherings, will be subordinated to business.

It is expected that this will be the greatest event in the history of the association.

Manufacturers, dealers, garagemen, central station interests, electric vehicle and accessory salesmen, and owners of vehicles representing interests from all parts of the United States will be in attendance.

Special arrangements have been made to secure extra train service from large cities to carry delegates to the annual meeting.

The association's sections which are distributed in all parts of the country will send many delegates.

An excellent program of papers has been prepared by some of the most well known authorities in the industry. Data and information will be in great abundance and many new developments to be presented are predicted to be of vital importance to the electric vehicle industry, and especially association members.

The annual meeting offers a splendid opportunity to obtain a valuable insight into the conditions of the industry, what the coming season promises, and just what suggestions will improve present

BY A. MARSHALL JACKSON

methods and policies to be used.

In the past year the association, through its efficient staff of officers, directors and secretary, has presented the value of the electric to thousands of interests throughout the United States.

As a result of this successful campaign, the membership has been greatly increased and interest developed in many who previously had rarely considered the value of this type vehicle.

Central stations especially will be well represented at the convention. In the past year, constant publicity, personal solicitation by association officers, and addresses and papers presented before central station conventions have promoted an interest which will be further accentuated at the coming meeting.

Cleveland offers a very appropriate location for a national convention. It is centrally located and within a night's ride from the largest electric vehicle using centers in the country. The event, therefore, should be well attended and electric car and accessory manufacturers especially should make all possible effort to be present.

The following tentative program has been announced and includes papers which will appear in full in future issues of *ELECTRIC VEHICLES*.

"Industrial Trucks in the Service of the Pennsylvania Railway Company," by T. V. Buckwolder, Pennsylvania Railway Company.

"The Electric Taxicab," by I. S. Scrimger, secretary and general manager Detroit Taxicab & Transfer Co.

"The Hartford Electric Company's Experience with the Battery Maintenance and Battery Exchange System," by Samuel Ferguson, vice-president, Hartford Electric Light Company.

"The Function of the Electric Garage," by R. Macrae, of the Commonwealth Edison Company.



Hotel Statler, Cleveland, Ohio, Headquarters of the Sixth Annual Convention of the Electric Vehicle Association of America.

"Comparative Development of General Power and Commercial Electric Vehicle Loads and Function of Power Salesmen as Electric Vehicle Solicitors," by H. H. Holding, general car representative and S. G. Thompson, general electric vehicle representative, Public Service Corporation of New Jersey.

"Problems We Are Facing and How They May Be Met," by George H. Kelley, secretary, Baker Rauch & Lang Company and president, Electric Automobile Manufacturers' Association.

"Field for the Small Electric Delivery Vehicle," by Charles A. Ward, secretary and treasurer, Ward Motor Vehicle Company.

"Electric Vehicles in Municipal Service," by Arthur J. Slade, Consulting Engineer for New York City.

"The Comparative Performance of Gasoline and Electric Vehicles in Similar Service," by Messrs. W. J. Miller & S. G. Thompson.

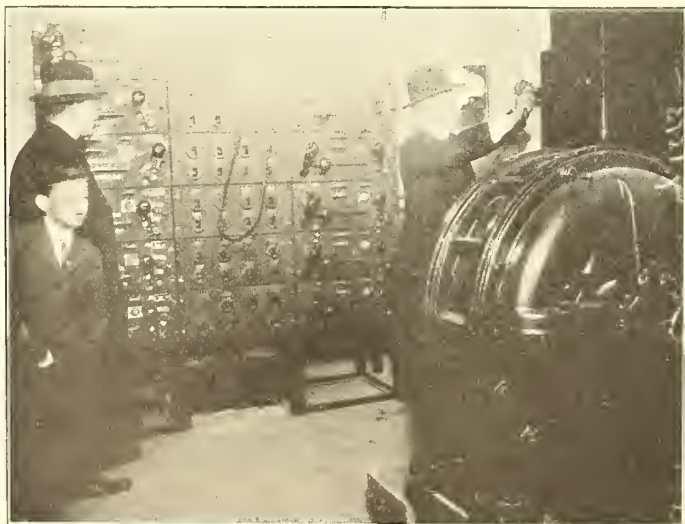
In addition to the papers indicated, there will also be the reports of the association's officers, 16 sections, and the standing and special committees.

Exhibits of electric vehicle equipment, appliances and parts of new design, will be held in the hotel adjacent to the convention hall.

Most Complete Charging-Station for Electrics in West

What is believed to be not alone the largest charging-station for electric automobiles in America—and, perhaps, in the world—but also to represent the very last word in equipment of the same, has just very recently been opened in Avondale, one of the aristocratic suburbs of the Queen City of the West.

By aid of a very complete series of switches, shown in the accompanying picture, current of required amount can be made to pass to any one of the



Large Charging Board Capable of Accommodating Seventy-five Vehicles.

charging stations there, outside. Anywhere from seventy to seventy-five automobiles can find position each side the central passage aforesaid, and so fast as one has been charged at any one such post, some other can be run up and filled in turn.

Waverley Electrics at the Pavilion Show

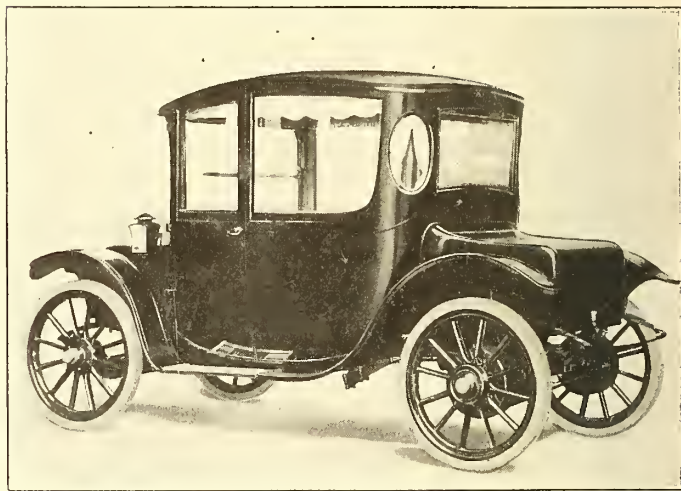
St. Louis started the 1916 auto show season with a Pavilion exhibit at Forest Park Gardens. The com-

bination of open air effect with abundant protection from the weather formed an attractive feature.

Among the cars exhibited were two Waverley electric broughams embodying as they do two widely different types of electrical and mechanical construction.

The Waverley 1916 light four is in every respect a departure from previous structural types offered by this company.

The car is mounted on a complete steel chassis



1916 Waverley Exhibited at St. Louis Automobile Show.

with long, full floating cantilever rear springs and semi-elliptic front springs.

The drive is of the worm gear type with single reduction perpendicular to the axle.

The controller is of the continuous torque drum type with single lever for forward and reverse, operating in horizontal plane over the steering lever.

The seating arrangement provides for two passengers besides the driver on the rear seat, the driver's seat being offset to provide free elbow room. A separate folding chair at the driver's right accommodates the fourth passenger.

A complete circle of windows surrounds the occupants, giving light and clear vision in all directions. A rain vision wind shield protects the front glass.

The battery boxes slope sharply both to the front and rear, giving with the rounded corners of the metal body a very pleasing design. The curve of the roof is very dignified and simple.

Model 112 Waverley four-chair-brougham has a longer wheel base than the light four and this permits the division of the rear seat into three separate chairs, one for each occupant, while the fourth passenger is accommodated as in Model 110 on a folding front seat facing the other guests.

Motor and driving system attached directly to the body instead of the chassis frame.

The Waverley parallel shaft drive with herring bone gears is used on this car. The controller is of the knife blade type, and the springs full elliptic and a quarter more for good measure.

There is something especially pleasing to feminine eyes in the lines of the electric and the sociable seating arrangement appeals equally to the taste of the ladies. No ladies at the show offered more varied and contrasting features than those exhibiting latest model electrics.

A Discussion of Gas Car Competition

Methods and Policies of Salesmanship Overcoming Inroads Made by Gas Car Manufacturers

THE automobile salesman selling passenger vehicles in the field every day, if he sells electrics or gas cars, soon learns from experience that the electric vehicle industry's present ideas and slogans, "that the electric has its field and that the gas car is not a competitor," is a very erroneous statement. Quite on the contrary, in every deal he not only finds other electric vehicle competition but also the gas car representative, who patiently waits until electric car salesmen have wrangled and "knocked" unfairly at which time he steps in and sells the disgusted prospect a gas car.

The very fact that the industry labors under a false idea, due to a lack of knowledge of conditions existing in the field, and its constant insistence that the gas car offers no competition, not only handicaps the electric car salesman but also furnishes ample opportunity to the gas car representative to attack an undefended fortress very much like the pugilistic trainer who allows his student to strike at every possible opportunity while he himself merely takes the defensive.

For many years the electric vehicle salesman has been taking the defensive—refusing to strike the greatest competitor. In the meantime the opponent has had ample time and opportunity to become efficient in attack and the result of his one-sided encounter constantly in his favor has amounted to much success in the sale of gas cars which might otherwise have been electrics.

Today the gas car is our greatest competitor. And this is very clearly proven by the fact that practically every manufacturer of gas cars is offering at least one model closely resembling and including those features for which the electric is commended.

Gas car coupes with beautiful body lines, luxurious interiors, electric starters, interior lighting, equipment and control "just like the electric" are advertised daily. In fact gas car manufacturers are offering to take in exchange used electrics for their latest coupe models, granting as a further incentive, unlimited mileage and speed which we are aware the

public well knows cannot be secured in the average electric.

It is self-convincing, then, that the gas car is not only a competitor but a powerful one, organizing constantly, and backed by great finances to usurp the field. As such, it must be defeated in its inroads, or the electric car will find a foe too well advanced and prepared to suffer elimination or even retardation.

In the matter of defense or actual invasion by electric car salesmen, they must utilize every opportunity to overcome this competition, for the advantage already secured in the general and greater popularity of the gas type, together with its preparedness and money to back any movement has erected a wall of competition already difficult to negotiate.

In attempting to sell electrics the very first step should be to remember *always* that if you can't sell your own make of electric, invariably help sell *some* electric—not a gas car.

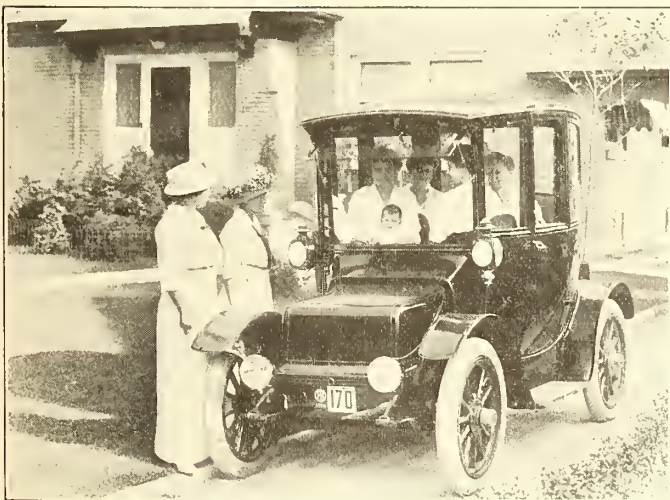
Thousands of electric car sales are lost annually because the electric vehicle salesman in his effort to sell a particular type, used cut-throat methods, unfairly exposed his competitor's product, causing the prospect to become dissatisfied with the type as a whole, resulting in another gas car sale.

Starting out with the sincere effort to sell your own type, and boosting the type in general, it is an easy matter to overcome gas car competition on the merits of each, for the electric is a good car and better for many reasons than a gas car. There should not be an electric car salesman who is not thoroughly enough acquainted with both types to prove in his own mind that the electric car is far superior to the gas type for city use.

If we analyze, it will be found in just what features the electric is superior and more practical as an investment.

It is to be assumed that the average buyer of an automobile desires five great features in his purchase:

Elegance, Economy, Reliability, Comfort and Exclusiveness.



Rauch & Lang Five-Passenger Coupe.



Detroit, Five-Passenger Brougham Equipped with Hawk Wire Wheels.

ELEGANCE.

In comparing these features in the two types we find elegance existing in the electric incomparable with any gas car, for the greatest development in graceful body lines and actual carriage building that man can originate are first found in the electric. From a fleeting view of this type to a detailed examination, the electric offers elegance and beauty not to be found in the gas car—at any price.

ECONOMY.

Economy, the much sought for requisite of the present day buying generation, has for years been a by-word of the electric. The electric coupe can be operated for 50 per cent less than the equivalent gas car type. Its cost per mile for power is nearly one-third less than the equivalent power in gasoline. Its repairs are practically nil. Gas car repairs alone keep thousands of garages doing a prosperous business. Garaging, care, inspection and like service could not be secured for a first-class gas coupe at twice the investment. Its long life and excellent used car value give it a greater economic value than could possibly be secured in a gas car.

RELIABILITY.

Reliability, which represents satisfaction and resultant happiness of possession, is a word which should never be applied to the gasoline automobile, whereas the very simplicity of moving parts makes it the electric car's greatest attribute. Gas cars, even the very best makes, are a complicated moving power plant with numerous and delicate working factors open to constant adjustment and continual trouble, resulting in a loss of metal poise, economy and reliability. Many a proud gas car owner has suffered the consequences of starter trouble, engine failure, stripping of gears, slipping clutch, worn out spark plugs, demagnetized magneto refusing to function, carbon in cylinders, inefficient carburetion, frozen or overheated radiator, exhausted batteries and a thousand other troubles which have cost him unlimited sums of money. Indeed, the elegance of one's car soon vanishes through the muffler with the ambitions of high power, smoke, odor and speed when the smallest part causes every other part to go wrong and to detract the joy of motoring.

COMFORT.

Comfort, the greatest desire of automobile owners, like reliability, should no more be attributed to the gas car than to that ancient Greek who sat on his throne with a cross blade sword suspended by a horse hair directly over his head. But little comfort can be secured from a vehicle when the owner is constantly wondering how long it will be before it develops its next trouble and sever the hair of momentary peace and safety by liberating a multitude of unfixable troubles, to empty his purse and heart.

Even from a viewpoint of physical comfort, the gas car lends vibration, continuous jerks in changing speeds and a lack of luxuriousness in seating arrangements, entirely unknown in the smoothly running, gradual starting and stopping electric.

EXCLUSIVENESS.

Exclusiveness, the natural ambition of man and beast, is obtainable in the gas car only in speed, excess power and quantity. In speed the gas car affords ample opportunity to visit the speed courts and be booked as a violator of public safety. But for the

gas cars, taxpayers wouldn't have to support, at a big expense, a special court and staff.

Excess power is rarely utilized and expensive. The mere knowledge of having power on hand often leads to speeding and accidents.

Quantity, like excessive power, is a most undesirable feature in any possession. Quantity means extra expense of controlling and propelling and is incomparable with quality, which exists in the compact electric. These are the only features which make the gas type superior. An analysis will prove these surface illusions easy to overcome.

On the other hand the modern electric is the life long car, as speedy as the law permits, wastes absolutely no power, and allows a mileage sufficient for all demands except touring. In the latter instance, for economical and time saving reasons, it is far better to use our railroads. Anyone can operate an electric, men, women or children. The mechanical engineer or the expensive chauffeur is only necessary for the gas car or other complicated mechanical contrivances.

There is not a factor from the hub cap to the quality of the varnish on an electric which does not excell the gas car. With the wolf located in the barnyard it is not only easy to protect the fowls but more easy to eliminate it and give the public an opportunity to awaken to the advantages of a real automobile—the electric.

Confront gas car competition at every opportunity. Save your prospect from developing a tape worm continually demanding large expenditures of money for maintenance and repairs.

Study the gas car, its weaknesses, its faults and its disadvantages, that you may advise the prospect on what he is about to expect. The gas car representative is your competitor, somewhat disguised, but never overlooking a bet—a win over you who must recognize your foe before you can eliminate him.

Walker Trucks at Exposition

The Walker Vehicle Company, manufacturers of Chicago electrics and Walker electric trucks, has placed an interesting exhibit of its line of 1916 electric vehicles in the automobile trade and good roads palace at the Panama-Pacific International Exposition.

It is understood this will provide the only exclusive electric motor car manufacturers' exhibit of combined lines of electric commercial and pleasure cars. Representing the pleasure cars will be one of the latest 1916 model Chicago electrics. The truck division will show the latest model one and two ton capacity Walker trucks.

G. A. Freeman, vice-president of the Walker Vehicle Company, will spend the next three months with the exhibit, as well as visiting the principal coast cities in opening business relations with the leading motor car dealers of the West for the combined Walker lines.

License Trucks to Carry Passengers

An owner of an automobile truck for hire may carry passengers in Vancouver, Wash.

By the payment of \$1 any Washington owner of an automobile may secure permission from the county auditor, in the county in which he resides, to carry passengers for a period of 10 days.

Chicago Section, E. V. A. Holds Annual Meeting

Committee Reports Presented and Election of Officers Announced for Coming Year

THIRD annual meeting, Chicago section, Electric Vehicle Association of America, was held in the East room, Hotel La Salle, Chicago, Tuesday, October 5, 1915, at 6:30 P. M.

Practically the entire membership of the section was present including many electric car manufacturers, representatives, dealers, salesmen, garagemen and central station interests.

The annual event is one of considerable import to Chicago electric vehicle interests and, as in previous years, brought forth many distinguished local factors in the industry.

After an excellent seven-course dinner, the meeting was called to order by W. J. McDowell, the retiring chairman, who, after stating the purpose of the meeting, called on each of the officers of the executive committee for a report of their activity during the past year.

The first report was presented by Frank E. McCall, the section's secretary, who stated in part that the section had undergone a rapid development in membership and association interest. He further stated that attendance was especially good during the

year and that much was accomplished by hard and determined effort on the part of specially appointed committees. Mr. McCall's report was accepted very enthusiastically by the members present and a vote of thanks taken for his sincere activity in association work during his term in office.

Homer E. Niesz, in charge of the annual orphans' day outing, followed with a report on the splendid work done by the association in its affiliation with other automobile interests in giving Chicago orphans an automobile tour through the city's parks. Mr. Niesz thanked the members of the association who assisted in making this event a day of happiness to the poor and requested that in following years more enthusiasm be displayed in making possible even greater

pleasures to Chicago's needy orphan children.

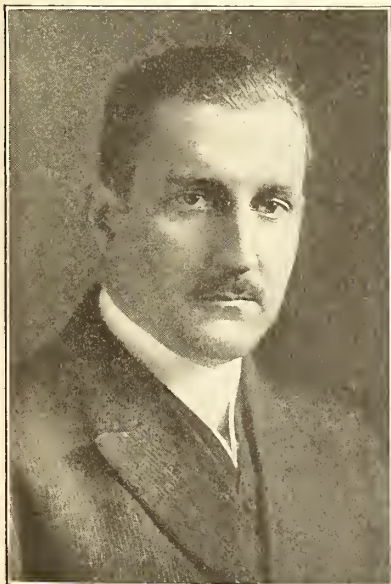
D. C. Arlington, chairman of traffic regulation committee, reported that his committee had done much to assist the owners of electric vehicles in Chicago. During the past year a booklet was prepared and distributed to all owners of electric passenger cars in Chicago, containing valuable information on rules of



George B. Foster, Chairman Chicago Section.



W. J. McDowell, Retiring Chairman.



Gail Reed, Chairman Garage Committee.

A Creed

We Believe in the Electric Vehicle.
We Believe in Its Supremacy for City
and Suburban Use.

We Believe in Promoting the Use of
the Electric Whenever Possible.

We Believe in Fair Play to the Pub-
lic.

We Believe in Fair Play to Our Com-
petitors.

We Believe in Making Satisfied Cust-
omers.

We Believe in Supporting Garages
Catering to Electrics.

We Believe in Sincere and Perpetual
Co-operation.

We Believe in the Power of Asso-
ciation.

We Believe in the Electric Vehicle.



Frank E. McCall, Re-elected Secretary.

the road, traffic regulation, dealing particularly with the necessity of adhering to regulations in view of avoiding accidents. The usual custom of driving in the middle of the road was also discouraged and suggestions made instructing owners to keep as close to the curb as convenient. The committee also investigated present regulations relative to street cars starting at boulevard intersections. A report was made, as a result of the inquiry, to the city park commissioner, requesting that some remedy be introduced making it possible for a driver to tell when a street car is about to start up, which since the customary bell has been substituted by an electric flash, is purely a matter of guess work. The committee also investigated the speed of gas trucks which were constantly offering opportunity of accidents, especially to the electric.

On membership, H. J. Butler, chairman, stated that the section had at present eight-five members, many of which were added during the last year. It was also shown that many had given up their memberships because of leaving the industry, but that so many new memberships had been added that it kept the average very high.

The garage committee, by its chairman, Harry Salvat, presented a report which caused considerable comment on the part of those in attendance. Mr. Salvat flayed the manufacturer for improper sale tactics employed in the sale of electric cars. He stated that the committee had proved that a common method used was to inform transient prospects that certain competitors were about to go out of business. In a visit to the particular competitors being "knocked," a similar sales policy was found in force. The logical result most naturally is a disgusted prospect and a new gas car sale. Mr. Salvat requested that manufacturers get together, eliminate the cut-throat methods and conduct business on those policies which will build rather than destroy the industry. Mr. Salvat's remarks were acknowledged with much enthusiasm and exposed subjects worthy of vital consideration by the section in the coming year.

The papers and program committee report was presented by Chairman D. M. Simpson. Mr. Simpson stated that the section had held forty weekly meetings, twenty-eight of which were addressed by special programs and papers. Many valuable papers and addresses were presented at these meetings and much data and information accumulated which deserved commendation.

All present realized from Mr. Simpson's remarks that this committee's duties were difficult ones and that they should be congratulated on their excellent work.

Mr. Bauer said in part: "Briefly outlining the work accomplished by your committee on standards during this year, I would state that the committee met for the first time about March, last. Considerable time was spent in organizing and preparing the work to be considered; in other words, systematizing and bringing down to a working basis the questions to be given attention.

"The first matter of great importance was to recommend as a standard the number of cells per battery of the lead acid type and the Edison.

"The basis of our considerations in this matter was the minimum voltage furnished by the Commonwealth Edison Company in its D. C. district in Chicago, which we found to be 115 volts. After considerable discussion, all matters being taken into consideration, we have rec-

ommended a 42 lead acid type battery and 60 cells of Edison, as being the most efficient.

"The second matter to be considered was the cells per tray and the method of assemblage; after due discussion we have submitted for your approval as standard, trays of from 2 to 7 cells each, and side to side assembly of rubber jars in tray.

"The next question to receive our attention was rubber jar dimensions. If my memory serves me correctly, there are now in daily use about 28 or 29 different sizes of rubber jars. We have cut this number to 8 or 9 which we believe will simplify the various assemblages to a great degree—certainly an improvement over the present methods.

"It must be remembered that the above standards have only been arrived at after extensive investigations and your committee is of the opinion that, if considered as they should be, will greatly simplify the battery assemblages for electric vehicles."

Standardization, a subject of vital interest in the automobile industry, was very comprehensively discussed by Chairman W. F. Bauer. Mr. Bauer's report showed that his committee had made a very exhaustive start in the study of standardization and that although this work was but in its very swaddling clothes it would develop into a great volume of valuable information to the electric car industry.

W. C. Hatley, chairman of the electric parking committee, was unable to attend. His report was made by George B. Foster who explained that recent action by the city council requiring unattended vehicles to stand in the loop district for a period not exceeding thirty minutes, caused the association to take immediate action in assisting women owners who desired to use their vehicles for shopping. A committee was appointed and a project put into operation whereby certain garagemen, members of the association, could use the Commonwealth Edison Company's Electric Shop as a headquarters from which owners' vehicles could be parked in Grant Park to be returned by a hiker on call. (A full account of this system appeared in the September issue.)

The parking system will furnish to owners a greater service than ever before rendered and should be of great assistance in increasing the sales of electric cars in this city.

Following the committee reports, the retiring chairman complimented the committees on their work and announced the election of officers, the candidates being as follows:

George B. Foster, chairman; W. F. Bauer, vice-chairman; F. E. McCall, secretary-treasurer; Homer E. Neisz, orphans' day outing; A. J. Brechtel, traffic-regulation; W. C. McNitt, membership; Gail Reed, garage; D. M. Simpson, papers program; and W. F. Bauer, standardization.

Immediately following a taking of the ballot Homer E. Neisz was chosen as toastmaster.

The guests then listened to a number of brilliant addresses by George B. Foster, Robert Bland and Mr. Brown. The toastmaster then delivered a short talk on the valuable co-operative work done by the retiring chairman and as a token of the association's esteem presented Mr. McDowell with a beautiful gold watch fob resembling the association's trade mark and studded with a diamond. Mr. McDowell thanked the members and the returns of the election of officers were then announced; the entire ticket of candidates being elected unanimously.

Chicago's Greatest Service Station

Anderson Electric Car Company Constructs New Fireproof Station to Care for Increased Sales

IN the automobile industry, service is the greatest requisite of success. For after the initial installation has been accomplished and the vehicle put in operation, the most important consideration in the minds of both the manufacturer and the public is the facilities and physical possibility of granting service. For undisputed service means undisputed supremacy in creating satisfaction to the owner; and satisfaction to the owner means recommendation.

It is but natural then that the purchaser of an electric should not only give special consideration to the particular type and its desirable features as compared with competitors' models, but weigh carefully the still more important element of just what facilities the manufacturer or his dealer can offer in the matter of service.

In this age of intelligent buying, the public has been well educated to the fact that service is as essential as oars to a row boat.

The Anderson Electric Car Company, manufacturer of Detroit electrics, one of the industry's most prominent manufacturers, has, in the course of many years of experience in selling electric automobiles, found that permanent success both for the industry in general and its own interests could only be obtained by furnishing every possible facility both in the selling of vehicles and the care and service of its cars in operation.

In a city like Chicago, the greatest electric vehicle using center in the world, the Anderson company has over 900 Detroit electrics in service. In accordance with the company's policies, every effort has been made to grant owners the service which they were informed they would receive when they purchased this particular type.

As a most logical conclusion, constantly increasing sales have taxed service facilities to the utmost.

The facilities for inspection, charging, repair work, etc., usually found crowded into the rear of the sales offices are by far too inadequate.

To-day, this progressive company offers owners in Chicago a service station which is without a doubt Chicago's finest, designed and equipped with every facility to secure service at a minimum of time, effort and expense to the user.

Located at 2429-31 Wabash avenue, the new station covers approximately 15,000 square feet extending 194 feet back from the principal thoroughfare which incidentally is a well paved street and just

adjacent to both the company's sales offices and the boulevard.

The principal feature in designing the station was to secure ample floor space without the inconvenience of supporting posts which, in the average station, are so instrumental in causing congestion and accidents to vehicles.

Built of brick, the structure of one story and basement type presents many new ideas in service station construction.

The very fact that it is of but one story eliminates second floor troubles; that is, the opportunity of injuring vehicles in raising and lowering cars, straining axles in carelessly moving cars from elevator platforms, time and labor in moving parts to floors above and principally a general loss of natural lighting facilities.

In the matter of lighting the new station is well equipped. Windows above the main entrances and



Interior View of the Detroit Electric's New Service Station.

skylights in two rows, alternating, practically eliminate the necessity and expense of artificial light.

The floor of the station is of concrete covered by a wooden floor of maple which was constructed at a considerable additional expense. The wooden floor eliminates dampness, dirt, concrete dust and in general makes working conditions more comfortable.

In the floor ten pits, equipped with electric light and drainage facilities are of sufficient size to allow workmen to stand erect and work on all parts of the vehicle without changing the position of the car. Perfectly fitting lids close the pits when not in use.

In the extreme rear of the station a balcony extends the entire width, and for some distance along either side wall allowing as it were a court preserving the natural lighting facilities on the ground floor. The balcony is reached by a wide staircase and is utilized as a stock room, screened in and containing every part of a Detroit electric from the smallest screw to a new fender or axle. This is a valuable asset to the station in that owners may secure new parts in a moment's notice without awaiting factory shipment.

In the basement, employees' lockers, shower baths, wash and rest rooms and a heating apparatus furnish a maximum of convenience.

This is the model service station. To the industry it is an example of the product of a progressive company, to the public it is the best possible incentive to buy an electric and receive a maximum in service.

Battery System Offers Many Advantages

An Epoch-Making Development of Vital Concern to the Entire Automobile World

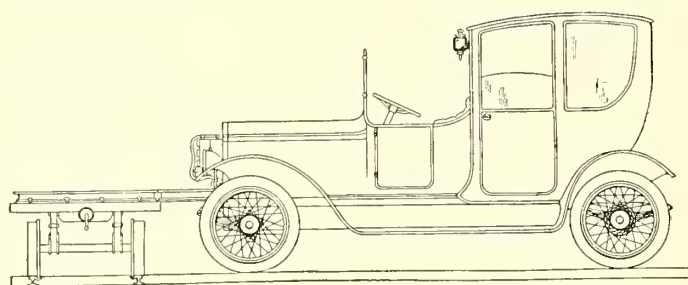
RANKING with the tremendous interest manifested in the recent large price reductions of several makers of electric passenger vehicles is the very important development of the battery rental and exchange systems which many authorities seem to feel are destined to exert a far reaching influence on the automobile industry in general. Some predictions are to the effect that within a comparatively short time the demand for electric vehicles will become so great that it will not only tax the capacity of existing electric vehicle manufacturers, but will furthermore compel gasoline car manufacturers to enter the electric vehicle field extensively. This would mean that the electric vehicle is to supersede and acquire the supremacy now enjoyed by the gasoline motor, especially for city and suburban use.

These predictions might seem incredible to the uninitiated or to those who have been lulled into a sense of security through practice these few years. But to those who are conversant with developments

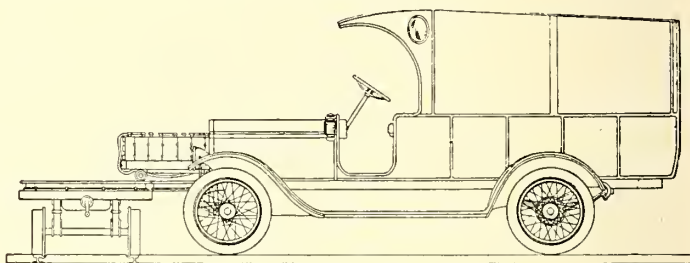
BY A. J. THORNE

to use the battery exchange and rental systems. However, it is stated that the purchasers have the option of buying it with or without batteries. To those who desire to buy without batteries a large deduction is made. They can procure rental batteries from a local battery company or through an electric garage.

The customer has the privilege of laying the car off for two months during the year's contract, for which time there is no charge for the battery after the customer has given the specified number of days' notice. The capacity of the battery in ampere hours is guaranteed to be kept up at all times when fully charged in such a shape as to deliver 80 per cent of its rated capacity. The battery rental company will make repairs of all broken jars, terminals or such minor repairs as are necessary from time to time to keep the battery in good operating condition. In other words, the amount paid per month to the battery company will cover all expenses and will provide the customer with a battery in prime condition at all



Electric Taxicab.



Delivery Truck of Multi-Battery System.

and possibilities, to those who make an unbiased investigation, it is apparent that the electric vehicle is assuredly the ultimate type of motor car, and, what is more important, is that this success is to be achieved very much more rapidly than even most of the electric vehicle enthusiasts themselves hope for.

The Electric Vehicle Association of America will treat with this epoch-making development at its sixth annual convention to be held Monday and Tuesday, October 18 and 19, at the Hotel Statler, Cleveland, to which convention all interested, whether members or not, are cordially invited. At this meeting Willis M. Thayer, manager electric vehicle department, Hartford Electric Light Company, which company has successfully extended the battery rental system to a large number of users for about three years, will present a comprehensive paper regarding his company's practical experiment with the battery rental plan. (This paper will appear in full in the November issue.)

There are a number of battery rental and exchange systems now available for electric commercial vehicles and it is interesting to note that recently large manufacturers of passenger electrics in Chicago have announced very great price reductions, the vehicles now being put out without batteries enabling purchasers who do not care to make an extra investment in a battery demanding a large expenditure

times. Whenever the battery, through use, fails to give the required mileage, a new battery is put in. The customer agrees to accept the responsibility for the loss of the battery in case of fire, theft or collision. The battery rental company agrees also that a deduction may be made from the rental if the battery is out of commission for more than twenty-four hours after notification by the owners of the car that it is in need of attention. The customer agrees to have the battery charged regularly and to give it reasonable care as to flushing and charging. The rental battery company has the right to inspect the battery at the customer's garage at a reasonable time, and further has a right to remove the battery from the car without notice at any time upon failure of the customer to pay the regular rent.

It is claimed by the manufacturer that there are many excellent arguments in favor of this rental battery proposition. In the first place, the exact maintenance costs on batteries will be known definitely to the customer. They will be no higher than the stipulated amount he pays per month for the full service. The customer, under this system, saves the cost of a battery, which is sufficient to pay for nearly two years' rental service. In addition to this, the customer who employs battery rental service has no extras for the washing of batteries and renewals. It is argued that it is by far the more economical method.

Electric Battery Propelled Fire Apparatus

Simplicity, Dependability, Positiveness of Control and Economy Essential Features

COMMERCIAL TRUCK COMPANY OF AMERICA sold

fifteen pieces of electrically propelled fire apparatus to the City of Camden, New Jersey, recently being one of the largest single orders for fire apparatus from one city ever placed.

We have excellent reasons for assuming this is and which we have excellent reason for assuming is but the forerunner of large additional orders from a number of other cities. It is the writer's understanding that upon delivery of this new apparatus there will be held in the city of Camden a unique comparative test, and from this test it is expected that some unusually valuable data will be secured. This test will probably be witnessed by a large number of traffic experts and representatives from various municipalities.

Electrically driven fire apparatus is used in only a few cities in the United States as yet, but where it has been used, namely, in Philadelphia, Baltimore, Springfield, Akron and Camden, it is greatly preferred to gasoline equipment, according to the statements of the various fire chiefs of those cities. The great advantage of electric equipment in fire department service is its simplicity of operation. Unlike the gasoline car, with its hundred of complicated, reciprocating parts, the electric has no transmission, no gear changes, no spark or gas control, and no clutch. It is practically impossible to cause any damage to the mechanism through mistake or carelessness in operating the electric. Its operation is very similar to that of a trolley car, and the driver of an electric does not require the skill that is necessary to operate a complicated gasoline machine. Our company instructs five men in the operation of each piece of apparatus purchased from us, with no charge to the purchaser. As we operate service stations in several large cities, it is not necessary for users of our trucks situated within a reasonable radius of these cities to carry spare parts or accessories. Any replacements of parts required by accident can be furnished immediately with no delays or possibilities of shipping wrong parts, thus insuring the purchasers uninterrupted service. In this respect, I may state that with very few exceptions we manufacture the chassis of our trucks in their entirety. Our factory experts make inspections of each piece of apparatus at least once a month during the life of the apparatus, and furnish written reports to the department at our own expense.

To cite further advantages, electric apparatus is always in instant readiness to start without the necessity of turning over the motor by cranking or self-starter. There is nothing about the electric to freeze and therefore no danger from broken cylinders or radiators while standing at a fire in cold weather.

There is a maximum speed for each piece of apparatus of 22 miles per hour, and with the exception of down grade it is impossible to exceed this speed. This acts as a safeguard against the danger of accident to persons, property or the machine itself. Assuming that the runs from fire house to fire average one mile,

BY E. S. HARE

it would be practically impossible for a gasoline car of equivalent weight, with twice the speed capacity of an electric to make any better average time. While it would undoubtedly travel faster than 22 miles in spurts, the time expended in cranking, in accelerating the speed through gear shifts, in shifting the gears again at crossings where traffic is congested, bring down the average time of the gasoline vehicle considerably. Therefore, while the excessive speed which might be temporarily reached by a high speed vehicle with its attending danger might be greater than 22 miles per hour, it would be of no material advantage over the electric's fixed speed, obtained in a minimum of time and closely maintained throughout the run, due to the fact that it is not excessive and that its control is simple and without gear changes.

We understand that the first requirement of a man in the bureau of fire is competence as a fireman rather than as chauffeur. As a fireman, his all-important idea is to get to the fire, and the fixed speed of an electric acts as a safety gauge on recklessness or incompetent driving. A great many alarms are answered where there is little need for the fire apparatus to put out the blaze, yet at such times the danger of accident to personal property or the machine itself is quite as great as where the apparatus is called to a serious fire.

The cost of operating and maintaining electric vehicles is considerably less per mile than the cost of operating a gasoline vehicle under city conditions. This statement is proven by a large number of prominent companies using our trucks, as well as high grade gasoline motor trucks. Gasoline trucks are used for the long hauls, which is their proper field, and the electrics are used for city and suburban work wherever they will fulfill the mileage requirements. The following is a list of a number of these prominent companies:

In Philadelphia: Adams Express Company, American Brewing Company, American Gas Company, Armour & Company, Bailey, Banks & Biddle, Bellevue Stratford Hotel, P. F. Brown & Company, Bernheimer & Schwartz Brewing Co., Central News Company, Chas. Beck Company, General Chemical Company, Curtis Publishing Company, Dill & Collins Company, Henry Disston Sons, Jefferson Hospital, Kirgan Provision Company, Pennsylvania Railroad Company, City of Philadelphia, Philadelphia Electric Company, F. A. Poth & Sons, Strawbridge & Clothier, Union Transfer Company, United Gas Improvement Company, John Wanamaker, American S. P. C. A. of New York, Baltimore Bargain House, Jordon Marsh of Boston, E. A. DuPont Powder Company of Wilmington, Delaware.

Guarantees from the storage battery makers show only two battery renewals are necessary for ten years' service, and that this is a conservative estimate is borne out by the statement of Chief W. H. Daggett of the Springfield Fire Department, who has had con-

siderable experience with electric fire apparatus. The economy of operating and maintaining the electric is largely due to its few working parts, which are revolving in their action, the least wearing of all movements. In addition, the motors are revolved by electric magnetism and not by exacting explosive forces. The electric car has less than one-half the total parts of a gasoline car. In connection with the above, it is of interest that Fire Chief Ernrich of Baltimore states that their steamer, which is driven by an electric tractor, is the most reliable and economical in their whole department and is always to be depended upon.

The ability of the electric to climb hills has sometimes been questioned, and therefore we wish to refer you to the records of the Philadelphia Bureau of Fire, which show that their steamer No. 57, equipped with our electric drive, on September 23, 1913, was tested from Station No. 9, leaving there at 2:20 p. m., reaching Box 991, Germantown avenue and County Line, Chestnut Hill, at 2:31 p. m., covering a distance of four miles in eleven minutes, which shows a running speed of just under 22 miles per hour. The time consumed to make the above trip with horse apparatus to the same box is thirty minutes, or nineteen minutes more. Chestnut Hill lies 440 feet above the sea level and to make this trip requires covering one of the longest and steepest hills in Philadelphia; in fact, the hills in that section of the city are so decided that the Philadelphia Rapid Transit Company has located a booster station and big storage battery reserve station in that section to supply additional current to help trolley cars up the hill. From Germantown to Chestnut Hill is a straight-way rise of something over 200 feet.

In addition, it is interesting to note that the *Edison Monthly* for September has just given the latest estimate of operating costs of Engine 217 of Brooklyn, which was converted three years ago from horse-drawn to electrical drive. The *Edison Monthly* states:

For the entire three years the total expense has been \$2,242.30. Included in this is an item of \$600 which is charged off as depreciation, the life of the equipment being estimated at twenty years. Current for charging the battery during the period cost \$289.80 at six cents per kwh., while the repairs and renewals make up the balance, \$1,352.50. Of this item \$509.57 represents the purchase of a new set of rubber tires, battery renewals represent approximately \$500 more, while the balance covers the cost of replacements of smaller parts.

It costs \$900 a year to operate a horse-drawn engine. Depreciation is figured at \$50, while forage, veterinary service, shoeing, stable equipment and harness add \$250 more for each of the three animals. For three years the three horses required for this type of engine would cost \$2,700. Compared with this the electric engine, during an extended period which has presented opportunity for every kind of repair and replacement, shows a saving of \$457.70.

The fundamental qualities of electrically propelled vehicles, namely, simplicity, dependability, positiveness of control, and economic operation, which recommend the electric to such a vast field of activities, are the same qualities which make it the most efficient and safest means of fire fighting.

"Detroit" Electric Shows Hill Climbing Ability

The accompanying photograph is of considerable interest in that it represents one of the greatest features of the electric battery propelled type—the ability to negotiate steep grades over road surface of the most unfavorable conditions.

The Detroit electric illustrated negotiated Spencer Street hill and is claimed to be the only vehicle, gas or electric, which was ever able to climb this grade.

The hill in question is 1600 feet long with an average grade of 18 per cent, the last 60 feet averaging a 40 per cent grade.

As shown in the illustration it was not only neces-



Detroit Electric Negotiating Grade 1,600 Feet Long Having an Average Gradient of 18 Per Cent.

sary to negotiate the grade but to "plough" through loose stone and gravel which has "stalled" every gas car which ever made the attempt.

This is surely convincing evidence that the electric can negotiate any natural hill.

Territorial Development of Electric Vehicle Sales

In Illinois, Iowa, and Wisconsin the Anderson Electric Car Company, with its Chicago branch as a distribution point, is developing an enormous business, according to George R. Veeder, central district sales manager.

The factory allotment to the central district included sale and distribution of 550 cars. Mr. Veeder, in proportioning the possible business for the year, basing an estimate on the amount of business done in the past two months, believes that central district sales will exceed 700 cars this year.

Branch houses and dealers have already been established in Peoria, Rockford, Galesburg, Springfield, Jacksonville, Decatur, Champaign, Aurora, Elgin, Ottawa and Freeport, Ill.

Agencies have been appointed also in Des Moines, Ft. Dodge, Marshalltown, Waterloo, Cedar Rapids, Dubuque and Davenport, Iowa.

In Wisconsin, Milwaukee, Racine, Janesville, Madison, Oshkosh, La Crosse and Green Bay "Detroit's" are represented.

Mr. Veeder predicts, after spending a week in the territory, that the sales of electrics will exceed those of gas car dealers made in previous years of similar priced vehicles.

The principal difficulty seems to be that dealers can't get cars as fast as they can sell them notwithstanding the fact that the Anderson company is putting out twelve cars a day and expect to total fifteen per day by October 20.

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If Your News Dealer Will Not Supply You—Please Notify Us

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Number 5

Tearing the Mask from the Wolf

GAS car competition is the subject of an article appearing elsewhere in this issue. For the last several years the gas car sales organization, wearing the mask of innocent disinterest, has made disastrous inroads upon electric vehicle sales. The opportunity has been placed in its hands without serious opposition.

Thus unmolested and unresisted, the gas car system has worked hard to discount the advantages of the electric. It has nearly succeeded. Today the claims of the better gas cars for luxury, elegance, convenience and simplicity are calculated to eliminate, in the mind of the buyer, all necessity for the electric.

"Just like an electric" has become a not uncommon claim of the gas car salesman. Superficially the visible facts bear him out. There are few purely electric characteristics that the clever and willing representative of a six cylinder coupe cannot readily meet with at least a flow of convincing words.

It matters little that the gas car later, like all of its kind, develops the familiar symptoms of noise, vibration, and trouble. Expenses for maintenance and repairs soon begin to mount up; inconvenience and annoyance become a part of the routine of ownership. The wolf has shown its teeth and the imitation its inferiority. But the harm has been done. The sale has been made. For another year, at least, that prospect is lost to the electric.

Electric car manufacturers too long have refused to recognize the disastrous effects of gas car competition. They have even refused to recognize that it was competition at all, and have solemnly and owlily asserted that the "fields were different" and the electric was "not a competitor" of the gas car. Save the mark! What, then, is the electric a competitor of?

Not a competitor! We hesitate to estimate how many sales of electrics have been lost because the electric would not compete and the gas car would and did. We cannot doubt, however, that sixty per cent of the sales that should have been electric have gone to the credit of its competition—mark the word.

Ignoring the gas car is the line of least resistance. As a competitor it looms tremendous on the horizon of opposition. It has the advantage of low price and unlimited advertising, and the physical preponderance of forty cars to one. It is a hard handicap to beat. But fortunately it is not necessary to enter the lists for a test of strength. Mere recognition of danger and effort toward preparedness is a big step forward.

For the electric vehicle interests are beginning to realize the competitive force of the gas car. They are beginning to see that the public makes its choice as between gas and electric—and generally chooses gas. They are coming to know that the gas car salesmen are fighting the electric tooth and nail.

It is time for every unit in what we know as the electric vehicle industry to concentrate thought on an analysis of present conditions. Such analysis includes a thorough study of

gas car sales methods—for two reasons. For one, there is much to be learned by studying the methods of a successful competitor. For the other, it is necessary to know the nature of weapons that are used against you.

The electric car sales organization as a whole is efficient enough to meet even the furious onslaught of the ever active gas car sales force. But its efficiency cannot operate if its employers persist in keeping it off the firing line and maintaining a "too proud to fight" attitude. Competition is warfare; the electric car interests cannot observe a Quaker-like spirit and hope to wrest the spoils of war from an aggressive, pugnacious and wholly successful adversary.

Why Avoid the Small Truck Field?

IMAGINE a practical student of transportation conditions who knew nothing about electric vehicles. Ask him where such a vehicle would find a field. Five to one his answer would be, "Just the thing for small truck work."

And it IS just the thing for small truck work. That is not only logical but self evident. We need not go over the technical details of the reasons why. The questions of short haul and frequent stop, convenience, cleanliness, simplicity, etc., are familiar to all who have given the subject any attention at all.

The retail milk and grocery business, and all the other industries of that class and field, offer the electric vehicle a bigger opportunity than any it has yet enjoyed. The "prospects" developed by a study of this field may be counted by the tens of thousands.

The electric truck manufacturers have been attracted by the possibility of selling whole fleets of large trucks to the comparatively few users of big delivery or transportation systems. In this field they have made considerable progress, and will continue to make it. But important as that opportunity is, the field of the small truck dwarfs it.

The manufacturing problems of the small truck are not exceptionally difficult. There are, indeed, several excellent models now on the market. The real problem is for the sales organization.

Selling small trucks—and by small trucks we mean, of course, the size that can economically replace the retailer's delivery wagon—is similar in many ways to selling passenger vehicles. It means, in most cases, selling one car to one individual. The successful passenger car salesman can sell small trucks. The sales methods, of course, are different; the passenger car is sold largely on appeal to vanity, while the wagon is sold on proof of its economy and efficiency.

There is some resistance to getting started in this field. The small retailer, operating one or two horse delivery wagons, has no traffic figures of his own, and no electric-using competitors to guide him. In this respect he is a harder sales prospect than the expert traffic manager of a fleet, who knows all about efficiencies and capacities before he buys at all.

The thing the small retailer needs is an object lesson or two in his own town. Of course that means the old paradox of nobody starting because nobody else starts. But intelligent sales effort can overcome the difficulty and get a few small trucks to working in each community. Once the possibilities of the light vehicle are known it will sell a good deal faster than the passenger car has ever sold.

The gas car people are beginning to make good headway in this field. That fact should help rather than hinder the sales of electrics. For once the small retailer gets the motor delivery habit, it should not be difficult to show him the superiority of the electric.

In the commercial vehicle field the question of time payments has often been discussed. Time payments in the passenger car field is a very bad policy; in the commercial wagon field it is emphatically good policy. The man in business is responsible; and the extent of his responsibility is easily determined. There is no reason why any loss to the truck manufacturer should occur through properly secured extension of payments. It is a justifiable and, indeed, advisable accommodation to the buyer; for such accommodation in many cases is what makes the sale.

By all means give them credit if they deserve it.

Boost the Electric—Boost Your Competitor

AT A recent meeting of the Chicago section, Electric Vehicle Association of America, a prominent exclusively electric garageman and electric vehicle enthusiast made the very broad statement that the present sales policies of electric car manufacturers and their dealers, if continued, would put every electric car manufacturer and electric garageman in the hands of receivers.

The statement referred directly to the evidently common policy which dealers are employing of knocking their competitors.

Prospective buyers, it seems, are confidentially informed that those competitors they happen to mention are on their "last legs"—financially incapable of continuing further in business and liable to bankruptcy proceedings immediately.

Then these same prospects, visiting the competitors previously discussed, are similarly informed concerning the financial standing of the first maker mentioned—and others. The natural result of this horse play is the sale of a gas car.

In the electric vehicle industry there is a total of but 12 manufacturers. Every year brings some consolidation and decrease in this total number.

The industry cannot afford to lose a single manufacturer, because the fewer there are the smaller the value of the industry, and the less cars sold. Inferences that competitors are facing financial distress is often of great weight with probable buyers and rarely if ever further investigated. The industry is soon contaminated by a feeling of insecurity. Considering that electricians at the best are difficult to exploit, detrimental exposures made dishonestly and unjustly are symptoms of unbusiness like methods which never yet have brought legitimate and permanent success.

Until manufacturers learn to sell by fair methods, to boost the electric and all its makes rather than attempt to climb to supremacy on the bodies of their rivals, the public will find it easy to doubt the reliability of any.

Many manufacturers claim that competitors must be overcome at any cost and by any methods available. Sales at this price and by this policy can never build up a substantial business.

Sales tactics must be revised. Fair business methods must be substituted for the improper ones too often used at present.

Salesmen who fall back upon such desperate means to save a prospect for themselves, either have not been sufficiently instructed, or they have no faith in the merits of the thing they try to sell.

Knocking any competitor is bad business—not merely from its moral standpoint, but because it generally nauseates a rightminded prospect, and so does more harm than good. Knocking ALL competitors is the height of folly. First, nobody swallows it; second, it arouses considerable doubt if the knocker can be all right if all others are wrong; and third and worst of all, it brands the whole industry as unsubstantial, ephemeral and false. No buyer who has accumulated the price of a good electric will spend it in a market where everybody is alleged to be going out of business.

We are no moralizers, and we are not arguing for a business millennium. We recognize that business is war—and success to the hardest fighter. But where the public referees, the hitter below the belt is ruled out. The knocker gambles on a boomerang. He MAY get away with it; but it is very apt to come back and lay him out cold.

With only one electric sold for every forty gas cars, there are surely sales prospects enough for ALL the manufacturers in the electric field. If the abuse and disparagement now directed against rival electricians were projected against the gas car, the electric would make more progress. Its merits are obvious and easily understood; why not use them as sales arguments for a change?

The salesman in the field constantly is the logical one to bring about this change. Manufacturers and dealers should combine in their sales policies, special suggestions and plans to compete and even eliminate competition arising from this powerful source.

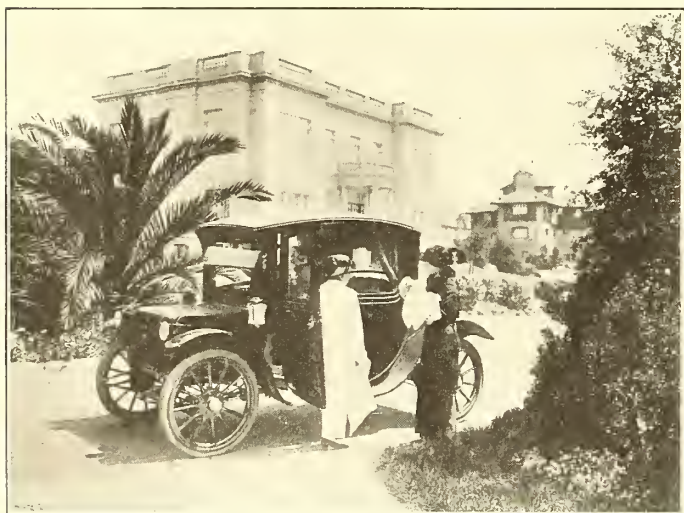
Boosting the electric, not only your own particular type, but the vehicle in general is the first step to this success.



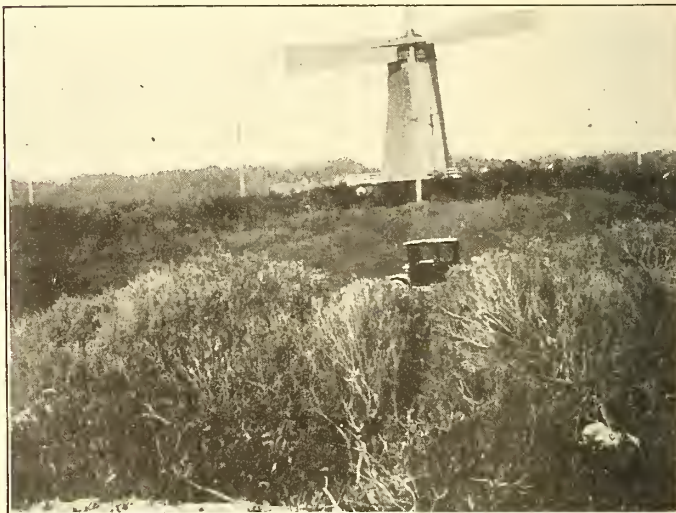
"Detroit" Electric Making Sociability Run.



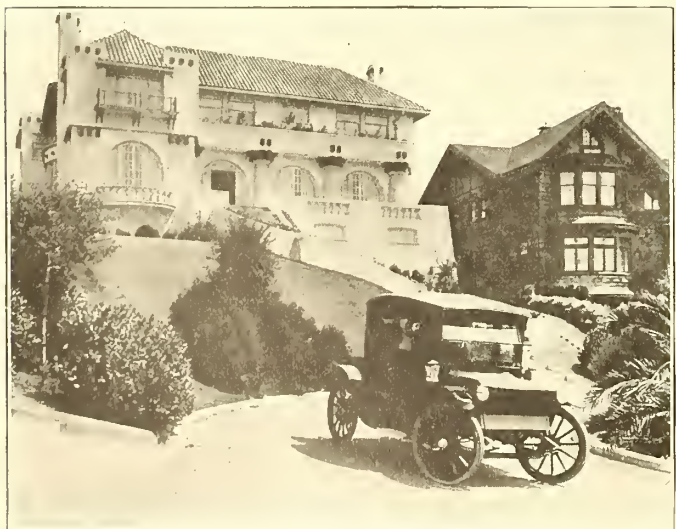
Rauch & Lang Coupe.



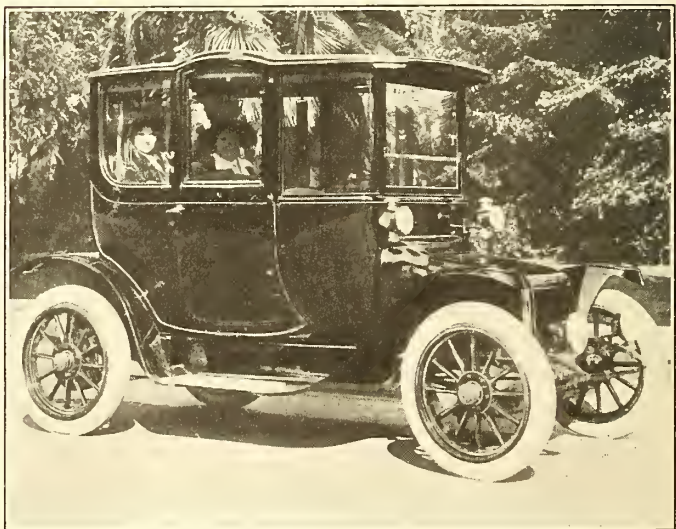
Waverley Electrics Are Used Extensively in Los Angeles.



Chicago Electric Making Cross Country Run.



Waverley Five-Passenger, Double Drive Brougham.



Chicago "Arch Door" Five-Passenger Coupe.

Passenger Electrics Have Been Adopted in all Parts of the United States

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

THE following is a review of association activities from August 25:

CINCINNATI

At the direction of Chairman J. W. Schrantz, a special meeting of the executive committee was called for Monday evening, August 30, at the office of the Walker Vehicle Company, 515 Mercantile Library building at 7:30 P. M.

The meeting was called to order by Chairman Schrantz, and a list of subjects prepared by the Secretary was discussed. Messrs. Schrantz and Ogden told the committee of an offer made by the Cincinnati Chamber of Commerce toward having the 1916 convention of the association brought to Cincinnati.

Their offer was so generous, and the advantages that would be derived from having this convention in Cincinnati so great, that it was unanimously decided to try and get it for Cincinnati in 1916; it was suggested by Chairman Schrantz that it might be wise to ask W. W. Freeman's advice upon this matter, and W. A. Wadsworth was appointed a committee of one to confer with Mr. Freeman and report at the next meeting.

A census was then taken of the possible delegates that would attend the sixth annual convention in Cleveland. Although no general canvass of the membership was made, it was learned that at least 7 could be counted on, a number which might later be increased to 15 or 20, if it was decided to try and capture the 1916 convention.

The subject of papers and discussions for the coming year was then brought up, and after a lengthy discussion it was decided best to drop this matter until the membership of this section was such that a fair attendance could be expected.

The question of an aggressive membership campaign was suggested by C. E. Ogden, secretary, and this was made a special subject for the next meeting.

The Cincinnati Auto Exhibition was then discussed, but it was decided best to wait until after the next meeting before discussing this further, as there is a possibility of an Electrical Exposition in Cincinnati during Electrical Prosperity Week, which exposition would be an opportune time for the display of electric vehicles.

Central Station Co-operation was discussed, and soon dispensed with by Mr. Wadsworth's statement that his company was willing and anxious to co-operate with this section as soon as they were able to perfect an organization.

BY A. JACKSON MARSHALL



A. Jackson Marshall, National Secretary.

Mr. Ogden, secretary, suggested a Bureau of Information, Complaints and Adjustments for Electric Vehicle owners, similar to that operated by the New York Edison Company. This was thought a very good idea by those present, but impractical at the present time.

The subject of additional charging stations was discussed, and Mr. Wadsworth stated that his company, the

Union Electric Light and Power Company, was doing all they could to speedily rectify this condition.

The subject of an Electrical Prosperity Week was discussed at length. Mr. Kelly told of what he was doing in this line in Dayton, where they have scheduled a Greater Dayton Electrical Prosperity Week in November. This idea was enthusiastically approved by all present, and it was unanimously decided to boost an exposition of this kind for Cincinnati, exhibiting as many electric vehicles and accessories as possible.

Plans are now under careful preparation.

As W. W. Freeman is chairman of the local committee for the Society for Electrical Development, Mr. Wadsworth was appointed a committee of one to confer with Mr. Freeman, and get his idea on this subject. Mr. Wadsworth was instructed to report at the next meeting.

Mr. Schrantz suggested that the next meeting of the association be held with the Electric Club and that that night be designated Electric Vehicle Night at the club. It was also suggested that a well-known speaker be secured for this night to talk on the electric vehicle, and Mr. Schrantz was appointed a committee of one to confer with Mr. Breet of the Electric Club, and make arrangements accordingly.

In view of the short time before the Cleveland convention and the Electrical Prosperity Week, it was decided to hold a special meeting of the executive committee on Friday, at the Hotel Metropole, at 12:30 noon, and hear the reports of the above special committees.

SAN FRANCISCO SECTION

On September 1 at the Engineer's Club, the San Francisco section held a meeting, C. W. Hutton presiding.

A paper on "Dignified Salesmanship," by Mr. Day Baker, was read by the secretary. A very interesting talk on "My Experience with Electric Trucks in Manila," by Mr. Calfee of the J. G. White Engineering Company was presented. The talk was illustrated with photographs.

After the secretary had read several of the releases

of the association, Mr. Wakeman of the Edison Storage Battery Company, read a magazine article on "Electric Truck Operating Cost and Performance." This article showed the possibilities of the electric vehicle on hills and cross country work.

ST. LOUIS SECTION

The St. Louis section of the association held a meeting on September 14 at the American Annex Hotel, Chairman M. B. Strauss presiding.

The following officers were elected for the fiscal year beginning October 1, 1915:

F. E. Stevens, chairman, Stevens-Waverley Automobile Co., St. Louis, Mo.

A. E. Archer, vice-chairman, Ohio Electric Sales Co., St. Louis, Mo.

H. B. Marshall, secretary, Electric Storage Battery Co., St. Louis, Mo.

The following, together with the above officers, were elected to constitute the executive committee: F. N. Boyer, R. W. Leach, R. R. Doak, C. E. Michel.

A. E. Archer, as chairman of the advertising committee, discussed the question of advertising which has been attentively planned, and stated that nothing definite had been accomplished, due to the fact that some of the members had not shown a disposition to get into this advertising proposition; after considerable discussion, it was decided that, first of all, the electric vehicle dealers should decide definitely what they could do toward a fund of this kind and then some definite word could be obtained from the central station and accessory concerns. It was accordingly arranged that a meeting of the electric vehicle dealers will be held Friday, September 17, at which time something definite will be done one way or the other, and this will make it possible for the remainder of the local membership to be canvassed thoroughly to finally determine the total subscriptions that can be obtained.

The local section was grieved to hear of the recent death of Dr. Ekstromer, one of its members and a committee consisting of H. B. Marshall and C. E. Michel was appointed to forward a note of condolence to Mrs. Ekstromer on behalf of the local section.

It was with great pleasure that the St. Louis Section were officially notified that the Union Electric Light and Power Company had made a very material reduction in the rate covering electricity used in private charging equipments so that for the average user the cost for current will in future be reduced by almost half what it has been in the past. This will mean a considerable loss to the Union Electric Light and Power Company under present operating conditions, but they feel that the increased business which they may expect under this new rate will compensate for the reduction which has been made. A vote of thanks was extended to Mr. Michel personally for the work which he had done with his company in effecting this arrangement.

CHICAGO SECTION

On August 31, the Chicago section held a meeting in the secretary's office, 72 West Adams street, Chairman W. J. McDowell presiding.

The meeting was called to order at 1 p. m. Four applications for associate membership were presented by the secretary and approved. It was decided that further applications be taken on the basis of no dues until after October or the beginning of our next fiscal year.

The membership committee, H. J. Butler, chairman, reported that they had recently held a number of meet-

ings and had a number of new members in sight; that they had gone over their records as best they could and figured that for the year and a half of the present administration there had been about 46 new members obtained, while in the same time about one-half of this number had dropped out; that they were co-operating with the national committee in getting as many new members as possible before the next annual convention in October. They also promised to assist the secretary in a campaign to get more members from the garages in an effort to get more garages in the electric parking service.

The papers and programme committee, D. M. Simpson chairman, reported that a programme was arranged for the next two meetings of the coming season, starting September 7, and that they had enough other subjects to take care of at least six more future meetings.

The traffic regulations committee, D. C. Arlington chairman, had no further report to make at this meeting. A letter from Mr. Healey was read, in which Mr. Healey expressed high appreciation of the Chicago Section's attitude in producing the booklet entitled "Some Traffic Suggestions," which has been distributed to electric car owners.

The standardization committee, W. F. Bauer chairman, stated that the report of his committee in full would be in the hands of the secretary in about two days. This report contains many different items concerning electric vehicle equipment which has been taken up and thoroughly studied by the committee. Mr. Bauer then moved that the report be brought to the attention of our president, Mr. Gilchrist, for his approval, and that after having obtained his approval, that we submit the same to the national standardization committee of the Electric Vehicle Association. Considerable discussion ensued and the majority felt that this report was worthy of consideration and adoption, and that if adopted, would work a great benefit to the electric vehicle industry as a whole, and it was also stated that the Chicago section executive committee was ready to stand behind this report at all times.

The garage committee, Harry Salvat chairman, in reporting, referred to his letter just sent to the secretary, the gist of which appeared in the last issue of *ELECTRIC VEHICLES*.

"All principal electric garage men were interviewed and 95 per cent. of them claim that under present conditions they prefer the gasoline car business."

It was announced at this meeting that the annual meeting of the Chicago section would be held on October 5 in the evening with a banquet and special programme. Mr. McDowell announced that he would appoint a nominating committee within a few days and that same would be made known at the next regular meeting of the section, so as to have plenty of time for action before our annual meeting.

The next thing taken up was the question of the electric parking service. It was suggested that the operation of this service be turned over to the Electric Garage and Dealers' Association, which would probably be in a better position to handle matters of this sort.

The report of the annual meeting at Cedar Lake was read. On account of the bad weather at the time and just previous to the holding of the outing, the attendance was not as expected, with a resulting deficit in expenses, which would be taken care of by the four organizations taking part in the outing.

On September 7, at the Hotel Metropole, Secretary F. E. McCall presided, and as there was no regular programme scheduled for this meeting due to the inability

of securing a speaker whom they had planned to have, the time was given over to a get-together meeting.

At the chairman's request, each one present rose in turn and stated who he was and what company he represented.

D. C. Arlington announced that he had been appointed chairman of the nominating committee and asked that members send in their desires as to the personnel of the officers they wanted nominated so that the committee could best judge the wishes of the section members.

The matter of the coming convention was called to the attention of the members, and the consensus of opinion was that those attending from the Chicago section should go in a body.

The electric parking service was considered and discussed. At the request of several members, the chairman gave a brief history of the development and progress to date. Some expressed themselves as being afraid that this service would grow beyond their ability to care for it. The secretary explained that at the present rate of growth such a state of affairs would not be for a long time to come.

A meeting of the Chicago section was also held on September 14 at the Metropole Hotel, Chairman W. J. McDowell presiding.

Mr. Bland, the scheduled speaker, was unable to be present, so that the meeting was given over to various timely matters of interest.

The attention of the members was called to the annual meeting to be held October 5, and to the fact that the secretary was taking reservations for the Chicago section to go in a body to the Cleveland convention. A number expressed themselves as desirous of attending with the section party.

It was definitely announced that Robert Bland would be at the next meeting and give his talk on "Garaging."

COUNCIL MEETING

A council meeting of the association was held on Thursday, September 23, at 2 P. M. in the committee room of the Engineering Societies building, 29 West 39th street, New York City.

Those present were: John F. Gilchrist, president; H. M. Edwards, treasurer, and Messrs. Frank W. Smith, Charles Blizard, P. D. Wagoner, William P. Kennedy, D. C. Fenner, W. C. Andrews, R. Louis Lloyd, E. S. Mansfield, Charles H. Miles, Harvey Robinson, and the secretary, A. Jackson Marshall.

The meeting convened at 2 P. M., and many matters

of vital importance to the association and electric vehicle industry generally were discussed at considerable length.

The membership up to date was reported as follows:

Active		Associate	Auxiliary	Press	Total
C C	Mfrs				
109	26	908	13	30	1086
	135				

The meeting adjourned at 5.15 P. M.

CLEVELAND CONVENTION

The sixth annual convention of the Electric Vehicle association of America will be held in Cleveland, Ohio, on Monday and Tuesday, October 18 and 19, with headquarters at the Statler Hotel, the official program to include two days only.

An important work of the Electric Vehicle association of America is accomplished at its annual convention in bringing together its members and prospective members for combined effort in promoting the sale and use of electric vehicles. These conventions, in the past, have been largely attended and the work enthusiastically supported.

PARTIAL PAPERS PROGRAM

In presenting the following papers and authors at the coming convention the Association desires to call particular attention to the vital importance of their subjects. It is a rare occasion when a fund of so many epoch-making developments is assembled for discussion at one time. A complete list of the papers to be presented appear elsewhere in this issue.

Exhibits of electric vehicle equipment, appliances and parts, of new design, will be held in the hotel adjacent to the convention hall. These comprehensive exhibits will afford an exceptional opportunity to view and compare the latest achievements with which you should be familiar.

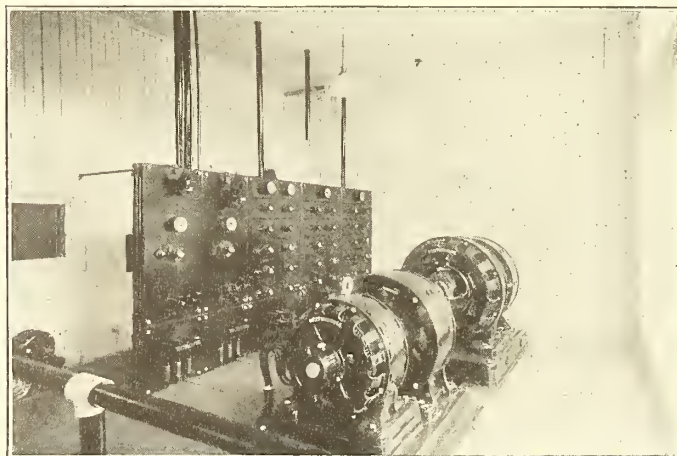
Space is still available for a few more exhibits. For information regarding same, address M. R. Berry, Chairman exhibition committee, 10514 Dupont avenue, Cleveland, Ohio.

Hotels and accommodations—As has been previously stated, the headquarters for the convention will be made at the Hotel Statler, where accommodations are procurable for a large number of delegates, the room rates of which are \$2 per day upwards, for room and bath for one person, and \$3 per day upwards, for room and bath for two persons; suites—parlor, bedroom and bath, \$10 and \$12.

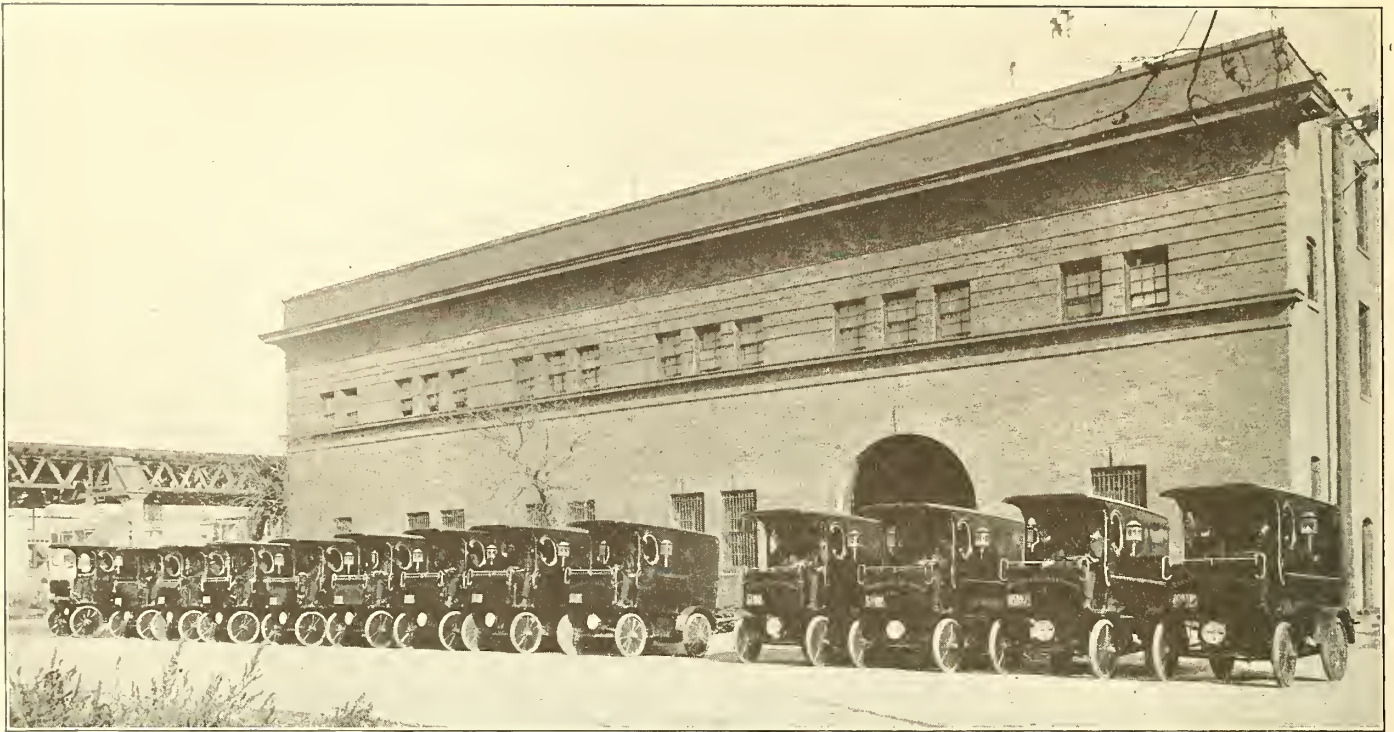
Desirable and convenient quarters are also available at the following hotels at the rates mentioned.



The Exclusive Electric Garage Increases Vehicle Sales.



Charging Plant of the Royal Garage, Chicago.



Department Stores Employ Large Fleets of Electrics.

The Hollenden Hotel dates per day with bath are as follows: For one person, \$2 to \$5; for two persons in one bed, \$3 to \$6, for two persons with twin beds, \$4 to \$6, and suites at various prices.

The Gillsey Hotel rates per day are as follows: Rooms, single without bath, \$1 to \$2; for two persons without both, \$2 to \$3; single room with bath, \$1.50 to \$4; for two or more persons (with bath), \$2.50 to \$5.

The aforementioned rates are based solely on the European plan.

The Colonial Hotel has both European and American plans:

European plan: Single room without bath, \$1.50 to \$2 per day; with bath, \$2.50 to \$5 per day; double room without bath, \$2.50 to \$3 per day; with bath, \$2.50 to \$7 per day.

American plan: Single room without bath, \$3.50 per day; with bath, \$4 to \$6 per day; double room, without bath, \$6.50 per day; with bath, \$7 to \$9 per day.

RESERVATIONS SHOULD BE MADE DIRECT WITH THE HOTEL

Special trains will be available from localities where a sufficient number of delegates will meet or board the special en route. For full particulars address H. N. Sibbald, Chairman Transportation Committee, Nela Park Cleveland, Ohio.

Registration:—It is essential that the association be advised as early as possible as to the number of members and guests who will be present. All who are interested in the manufacture, sale and use of electric vehicles, whether members of the Association or not, are cordially invited to attend and participate in this convention. Your kindness in supplying the information on the attached "registration card" will be greatly appreciated.

Additional information will be supplied on request.

An urgent request is made that registrations be sent in early to the Electric Vehicle Association of America, 29 West 39th street, New York City.

Members are kindly requested to advise if they will bring guests; also to give names of same.

PUBLICITY

During the past month, the association has received a great amount of very valuable publicity. It is indeed gratifying to see the continuously increasing number of magazines and newspapers which are giving considerable space to the association's activities and periodical releases and to note the number of foreign magazines with which the association has allied itself editorially. This educational work of the association, which is doing a very great work in breaking down existing prejudice concerning the capabilities of the electric, is also paving the way for sales and popularizing the electric.

Much of the recent popularity of the passenger electric vehicle is due directly to the informative and educational articles released by the association which come to the attention of the public through newspaper and magazine mediums.

Among a number of articles released during the past month by the Association, are the following:

- "By Waverley Electric From Buffalo to New York."
- "Electric Vehicle Accomplishments and Predictions."
- "Successful Parking Service Extended to Electric Vehicles."
- "Camden Installs Electric Fire Apparatus."
- "From Buffalo to New York in an Electric Vehicle."
- "Electric Vehicles Recommended for Use in Motion Pictures."
- "Battery Exchange Systems Applied to Electric Passenger Vehicles."
- "Convention Publicity."
- "George Cram, Released from Sing Sing After 21 Years' Imprisonment Sees New York in an Electric."

The annual convention will occupy but two days, but they will be very full days. The object of limiting the convention to two full days is not that we expect to accomplish any less, but that the members of this association are busy men, and the council felt that they would appreciate an arrangement which would enable them to attend this very important series of meetings without taking too much time from their business. Furthermore, the series of intense business sessions will more likely justify concerns sending large representations.

Electrics Recommended for Use in Motion Pictures

Ease of Control, Reliability Eliminating Opportunity of Expensive Interruption, and Quick Get-Away

JUDGING from some interesting figures given in the *Philadelphia Ledger* of August 3, 1915, the automobile has entered another field, and has definitely allied itself with another industry which is at present on the very crest of the wave. The motion picture business, which is now classed among the seven greatest world industries, has taken over the automobile as a necessary asset and the following excerpt gives a good idea of the tremendous number of cars being employed for this purpose in one state alone:

The moving picture concerns out there in Climateria or Cafeteria, as San Francisco is fond of calling its flourishing rival, use a powerful lot of cars and use them mightily roughly, too. The photoplay people in and around Los Angeles are using \$2,000,000 worth of motor trucks and passenger carriers. Just one concern and its actors are represented by 300 machines. Scores of used cars are bought for wrecking purposes. Southern California is buying about \$30,000,000 worth of cars this year.

As a result of using gasoline cars so extensively among people who are frequently not familiar with the extremely complicated mechanism of a gas car, many serious accidents have occurred to actors and thousands of feet of film have often been needlessly wasted.

The electric, with its simple mechanism and positiveness of control, will ultimately be recognized as the safest vehicle and the one best adapted to furthering the dramatic interest of the picture when the action of the plot is dependent on a quick get-away or an immediate stop. To further emphasize the danger of using gasoline cars in taking pictures of scenes where they must be operated by actors who are not skilled drivers, a number of instances have been collected where actors have either been seriously hurt or have barely escaped real injury. In a previous article on this subject the experience of Charlie Chaplin with an automobile was related and, while amusing, it might have had grave results.

While in conversation with Pell Mitchell of the Gaumont Film Company, who was taking some pictures for the Mutual Weekly in which an electric vehicle was an important feature, he expressed his keen admiration for the electric vehicle, especially when used in connection with motion pictures. Coming from such authority as Mr. Mitchell, this commendation of the electric in a field which as yet has been but slightly developed should be especially interesting.

As evidence of the danger and difficulty experienced in using a gasoline car in motion pictures, Mr. Mitchell described a most disastrous accident which happened some time ago. While taking a picture of a sensational "act" an automobile containing three passengers was to be driven directly to the edge of a precipice and stopped. The passengers were to leave the car and dummies were to take their place, being thrown over the precipice in the car, thus portraying a thrilling and realistic wreck on the screen.

The actor driving the car had had practically no experience in driving and when he got to the edge of the cliff he became panic-stricken. In his excitement and confusion, instead of throwing on the brakes he opened the throttle, accelerated the car and plunged it over the precipice with the passengers. While no one was killed or seriously hurt, all suffered painful injuries.

Accidents of this kind would be practically impossible with an electric. When a person in the position of a driver sees danger imminent and becomes fear-stricken, the natural impulse is to throw the body back, thrusting the feet against the floor of the car. In an electric the brake pedal not only throws on the brakes, but automatically cuts off the current. There is no accelerator to confuse him. The simplicity of operating an electric is one of its prime virtues. In traffic, its ease of operation, positiveness of control, and immediate response to the driver's touch recommends it especially as the vehicle par excellence for traffic-congested streets where frequent stops are necessary. Because of its few parts, there is nothing about an electric to get out of order and with the proper care and attention to charging and batteries it gives practically uninterrupted service at all times.

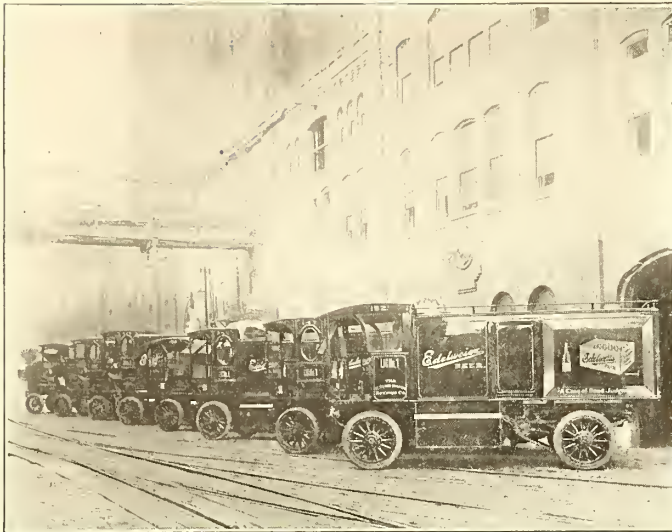
Pardoned Murderer Aghast at Electrical Achievements

One of many bewildering surprises for George Cram, 86 years old, who has recently been pardoned by Governor Whitman, of New York, and released from Sing Sing prison for good conduct after twenty-one years of imprisonment, was a new world that Cram found when he landed in New York City. Twenty-one years had wrought a considerable change, probably the greatest one being the tremendous advance made in electricity and its many appliances.

The Society for Electrical Development, which is developing many unique plans for Electrical Prosperity Week, November 29 to December 4, thought it would be rather interesting to reveal to this man for the first time some of the wonders of electricity. With the assistance of the Electric Vehicle Association of America, Cram was taken on a little tour of inspection, accompanied by the Goddess Electra (otherwise Doris Easton), who carried him off in her electric vehicle to the Grand Central Terminal, where she showed him the wonders of the electric locomotive, electric trucks and the hundreds of electric baggage carriers used in the terminal. An electrically prepared luncheon at the McAlpin Hotel was a revelation in modern methods of cooking. Of all the interesting devices which he saw, Cram seems to have been most interested in the electric vehicle. He was evidently mystified by the ease with which it glided smoothly in and out of the congested traffic along Fifth avenue. He marveled at its instant response to the driver's touch and at the small amount of effort required to control it.

As the old man remarked, "The world do move," and if he were in a position to own an automobile it certainly would be an electric.

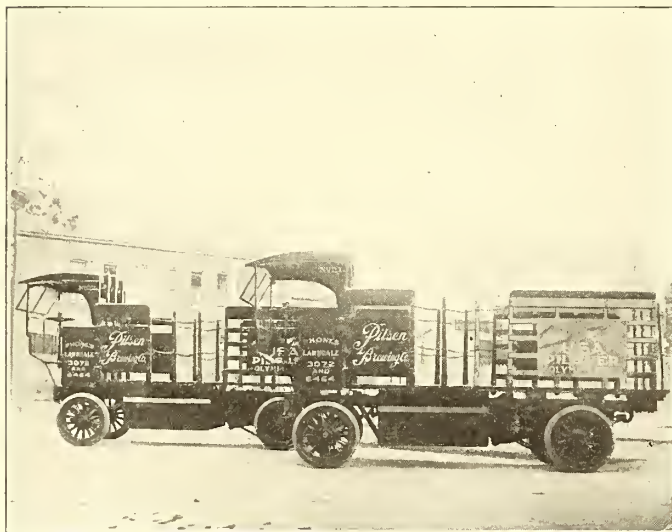
In all of our large cities dealers are enthusiastic for the future of the electric.



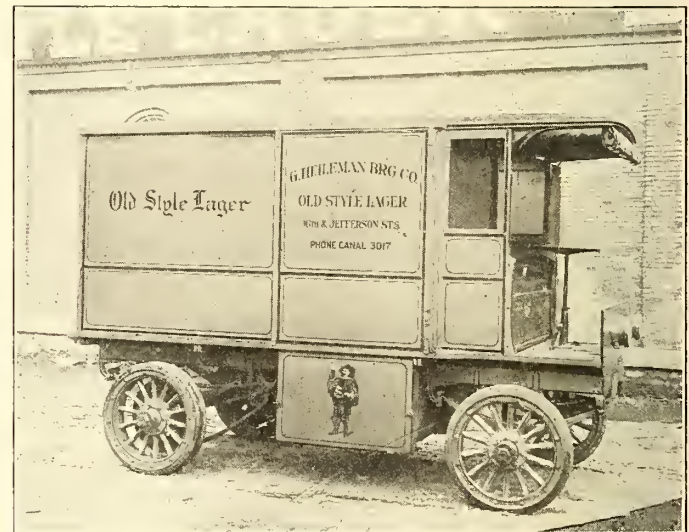
The Schoenhofen Brewing Company Employs Eight Electrics in Chicago.



Manhattan Brewing Company Is Highly Enthusiastic with Electric Truck Service.



The Pilsen Brewing Company Employs Two Electrics, Which Are Doing the Work of Many Two-Horse Teams.



Experiments by the Heileman Brewing Company with an Electric Truck for Case Beer Delivery Shows Most Favorable Results.



The U. S. Brewing Company Has a Five-Ton Electric for Case Beer Delivery.



Fortune Brothers Company Are Fast Selling Their Horses and Adopting Electric Trucks.

General Vehicle Electric Trucks Show a Great Economy in the Brewery Industry

Operating Cost Data of Electrics vs. Horses

Authentic Figures Showing Great Economy of Electric Trucks Properly Routed

ONE of Chicago's largest manufacturers, in the fall of 1913, made the statement that "There isn't a motor truck, of any description, that can be a paying proposition where deliveries are made in a territory from one-half to two miles from the plant. This work is most economically performed with horse and wagon."

Two weeks ago, this same manufacturer, when confronted with the above statement, frankly admitted that he, like many other manufacturers and team owners, had been most seriously mistaken in the economy and efficiency of the electric truck; that he was just beginning to realize that the electric truck was not so much a competitor of the gasoline propelled machine, but that its most profitable field of operation lay in the work that was now being done by the horse.

So we find most team owners and many motor truck operators still laboring under the misapprehension, that because of the slower speed and limited radius of operation, they feel the electric cannot do the work for which the gasoline truck is sold and owing to its first cost, the electric cannot possibly be cheaper than horse-drawn equipment for close in work.

Perhaps it would be well to consider the experience of the brewers for various reasons. First, it goes without saying that they owned the best that money could buy in the way of horses and wagons. They spared no effort in keeping this equipment in first-class condition. Further, they were the first to try out motor truck delivery as far back as 1900 and today there are practically 900 General Vehicle electric trucks in this particular line of service, of which 561 are 5-ton machines.

You will naturally ask why it is, that if the brewers adopted the electric truck in its infancy and proved to their satisfaction that it is a money-saving proposition, that we have not made similar progress in other lines of business where cartage is an important item in the sale of goods. Let us analyze the situation. First of all, everything in the brewery business is figured on a cost per barrel basis, that is cost per barrel of overhead expense, cost per barrel of manufacture, cost per barrel of selling expense and cost per barrel of delivery.

The first item is fixed and cannot easily be lowered. The second, cost of manufacture, fluctuates with market and labor conditions; the third item is practically a fixed cost. So when we finally get to the question of delivery, this is an item that the brewers were obliged to pay particular attention to, owing to the strong organization of the drivers, whose wages are based on the number of barrels delivered. Therefore, if there is any saving to be made, it must be made on cost of operating the conveyances used for delivery purposes.

Inasmuch as everything is figured on a cost per barrel basis, it is quite apparent that in this line of business it is an easy matter to tell the difference in the cost when deliveries are made with different types of vehicles. What conclusions the brewers arrived at,

BY A. J. BRECHTEL* after determining all their costs of deliveries with various types of vehicles, is self-evident in the fact that 121 brewers are using 892 General Vehicle electric trucks.

I have, perhaps, lent the impression in the foregoing, that the brewer is the only one who knows exactly what it costs him per package to deliver, but let us look around and see what other lines of business keep a very close tab on their costs of delivery per package and see whether they are using electric trucks. The express business is handled entirely on a per package basis and their experience with the electric truck is apparent when we see the number of machines they have in service and the fact that they continue to buy them. A large company just placed an order for forty-two 2-ton machines within the last sixty days. Department stores also figure their cost of delivery on the case basis. They are using more electric vehicles than any other line of business.

It is surprising, nevertheless, a fact, that very few concerns really keep an accurate cost system on deliveries. By this, I mean that there are many concerns who allow part of their delivery expense to become lost in the sundries account or allow the item to become lost in some other way and their books will show that it is costing them on an average of perhaps \$20 per month per head to maintain the horses, when, as a matter of fact, they are paying insurance and various other items on this particular part of their equipment which items properly should become part of their delivery expense.

I asked a certain manufacturer recently, who is operating between 40 and 50 head of horses, what they were costing him per horse per month. He was kind enough to call in his bookkeeper and ask for this information. This gentleman returned in about five minutes with the statement that their horses for last year had cost them \$22.40 per head per month. I naturally manifested some surprise and after explaining to the manufacturer that I believed there was something wrong with his figures, he asked me to go over the proposition with his bookkeeper and advise him later as to what I believed was his actual horse expense. You can imagine his consternation, when a few days later, his bookkeeper and I reported to him that the actual cost per horse per month was \$30.94 or \$1.19 per day for every day that the horses were actually in the harness and paying for their keep and the figures that he believed were his total upkeep expense covered little more than feed, shoeing and barn wages.

After studying the cost of approximately 700 head of horses in the city of Chicago, I have found that the expense averages between thirty-three and thirty-seven dollars per head per month. The lowest I found was \$27.60 per month and the highest \$49.46. The last named figure was high owing to a large charge for rent which we were obliged to consider.

These figures are not necessarily all from brewers, but inasmuch as brewers are credited with maintaining cost departments which determine every item of expense incident to the carrying on of their busi-

*Heavy Service Electric Truck Representative,
General Vehicle Company, Chicago District.

ness, the following data presents authentic operating costs obtained from vehicles in daily delivery service.

COST OF OPERATING AND MAINTAINING HORSE DRAWN EQUIPMENT.
INVESTMENT.

95 Horses @ \$230.00.....	\$21,850.00
Harness	1,670.13
Wagon	13,082.98
	<hr/> \$36,602.98

FIXED CHARGES.

Depreciation Horses	\$4,521.00
“ Wagons	726.00
“ Harness	336.67
Insurance	183.80
Taxes	935.00

\$6,702.47

OPERATING EXPENSE.

Feed	\$12,870.00
Shoeing and Veterinary.....	5,041.30
Wagon Repairs	3,364.90
Harness Supplies	572.00
Harness Maker	858.00
Barn Wages	8,511.80
Barn Supplies and Expense.....	2,090.00

\$33,308.00

INVESTMENT PER HORSE.

Horse	\$230.00
Harness	17.58
Wagon	137.71

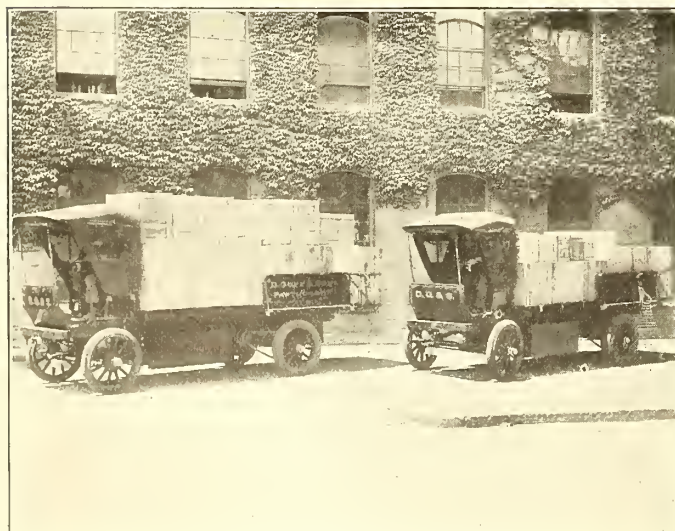
\$385.29

OPERATING EXPENSE PER HORSE.

	<i>Per Year</i>	<i>Per Day</i>
Feed	\$135.473	\$0.434
Shoeing and Veterinary.....	53.066	.170
Wagon Repairs	35.421	.114
Harness Supplies	6.021	.019
Harness Maker	9.032	.029
Barn Wages	89.589	.287
Barn Supplies and Expense.....	22.00	.070
	<hr/> \$350.602	<hr/> \$1.125

TOTAL EXPENSE.

	<i>Per Year</i>	<i>Per Month</i>	<i>Per Day</i>
95 Horses	\$40,010.47	\$3,334.21	\$128.24
1 Horse	421.16	35.10	1.35



Electrics for Heavy Package Delivery.

In comparison with the above, it is interesting to note that similar costs of operating 5-ton trucks run nearly alike under different conditions and in different installations.

Installation "A" averages per truck per day \$8.40
Installation "B" averages per truck per day 7.88
Installation "C" averages per truck per day 8.28
These figures cover all items contingent to the



Special Built Case Beer Truck.

upkeep and maintenance of the trucks, that is as follows:

FIXED CHARGES.

Interest on Investment.
Insurance
Taxes
Depreciation

OPERATING COST.

Repairs
Garage Labor
Battery Expense
Tire Expense
Grease and Waste
Vehicle Tax and License
Electric Current

After determining what the cost of operating an electric truck will be, let us consider the mileage question for a moment. The average 5-ton truck in any ordinary line of business is required to make from 24 to 28 miles per day. The 3½-ton truck is usually called on for from 25 to 30 miles and so on down, until we reach the 1-ton model which is seldom called upon for more than 40 miles.

Manufacturers' guarantees on mileage exceed the above named figures from 33 to 50 per cent and we have many instances here in Chicago where 5-ton trucks are doing as high as 55 miles on a single charge of the battery. So you see that its field of operation is not as limited as many would have us believe and that it is a fact that the electric truck is by far the most economical and reliable medium of transportation for 85 per cent of the city hauling. The fact that it is noiseless, odorless, easy to operate and that its wearing parts are few, in fact may be summed up in the following: three chains and about four sprocket, account for its long life and a maintenance cost which in dollars and cents amounts to less than horse feed. There are a number of trucks in service today in this city which were delivered from the factory to the General Vehicle Company in 1903.

[EDITOR'S NOTE:—"Gas Car Competitor," will be discussed by Mr. Brechtel in a near future issue.]

Ohio Electric Specifications for 1916

Principles in Construction and Operation

THE craftsman who has a pride in his work keeps ever in mind the ideals of serviceability and satisfaction in his product.

The builders of the electric cars carry these ideals much further. For their aim has always been to create a car which would not alone be up to the highest existing standards, but which would set new standards and improvements over earlier models.

The constantly growing appreciation of the most discriminating buyers of automobiles is the best evidence of the success of the electric.

The electric has been designed to be everything that people of taste and refinement could desire in a pleasure vehicle. Cost has been a secondary factor. That the electric compares favorably in first cost—and very favorably in maintenance expense—with high class gasoline automobiles, is due entirely to a careful and efficient supervision of all manufacturing details.

Master-craftsmen in their fields govern every step in electric car production. Men who are artists as truly as though they worked with brush and palette supervise every detail of design, upholstery and finish. Highly-trained mechanical experts inspect and thoroughly test every car for roadability.

It is these things which years ago gave the electric the title—"the envied automobile."

In view of carrying out the original principles of electric automobile construction, the Ohio Electric Car Company, Toledo, Ohio, is announcing four models,

Model 61, Limousine	\$3,250
Model 51, 5-passenger brougham.....	3,000
Model 41, 4-passenger coupe.....	2,900
Model 21, 3-passenger roadster.....	2,650

Many new principles have been incorporated into the latest models and various improvements added.

The mechanical details of Ohio construction are presented in the following:

Principle:—Chairless, direct shaft drive is used without universal joints. The motor, propeller shaft, torsion tube and rear axle form a transmission unit, which is suspended on cross members resting on the main frame. This method combines proper distribution of the weight with the utmost simplicity and effectiveness. There are no concealed chain reductions. All moving parts are enclosed in a dust-proof case and run in oil. This construction principle combines light weight

BY J. H. HORSLEY

with perfect lubrication and consequent perfect smoothness.

Motor:—The Ohio electric motor, especially designed, has always been noted for its wonderful combination of efficient power-delivery and exceptional hill-climbing ability.

POWER PLANT

The weight of the Ohio power plant is borne by the

frame of the car *above the springs*. In most other types of construction much of this weight—especially that of the rear axle and associated parts—is carried below the springs, called technically "unsprung weight." Most engineers figure that one pound of weight *below* the springs exerts as much wear on tires as ten pounds *above*. The superiority of Ohio construction in this regard is therefore apparent.

Drive:—The drive is direct from motor to wheels, without universal joints, thus developing the maximum of efficiency in the transmission of power, with the least possible friction.

The propeller-shaft, torsion tube, main axle tube and differential gears are high-grade nickel steel. The entire steering mechanism operates on ball-bearings, making possible control almost without effort.

Either worm gear or the more recent and highly developed helical bevel gear drive is furnished on models 62, 42 and 22. The helical bevel gear is used on model 12.

Braking:—In addition to the company's popular magnetic brake, two pairs of independent, powerful foot brakes, of non-freezing type, which operate on large hub drums, are furnished. A very slight pressure on the pedal is sufficient to operate them.

The left foot-pedal operates the service brakes, which can be used for regular stopping to the exclusion of the magnetic brake, if desired.

The right foot-pedal operates a second pair of effective brakes for emergency use. An automatic cut-out attached to this brake cuts off the power as the pedal is pushed down. When the pedal is released, the car is inoperative until the controller disc is returned to neutral position. A ratchet appliance on this emergency brake serves to automatically lock the car on grades or when leaving it.

RUNNING GEAR

Frame:—is of cold rolled pressed steel in channeled



1916 Ohio Coupe Announced by the Ohio Electric Car Company, Toledo, Ohio.

section. It is one guage heavier and considerably deeper than in earlier models. The front end of the frame is offset so as to give short turning radius.

Front Axle:—is a one-piece, heavy drop-forged I-beam. Spring saddles and yoke ends are forged integral with the axle instead of being brazed to a tube. Steering knuckles are especially strong drop forgings, with ball bearings to carry the weight of the car. The cross-tie rod is located behind the axle, where it is guarded from all road obstructions.

Rear Axle:—is a full floating type of latest design, the weight of car being carried by the housing, in accordance with the practice of the best automobile engineers.

Springs:—are of double heat-treated chrome vanadium steel. The springs are semi-elliptic front, three-quarter elliptic scroll in rear.

Wheels:—artillery type, are the best second-growth hickory; or Rudge-Whitworth wire wheels, with hubs especially designed are furnished.

Successful Parking Service Extended to Electrics

There is a much needed system for parking waiting automobiles in our large cities, and as evidence of this need, cites instances of the annoyance caused the owners of private houses in certain residential streets by stationing automobiles for hours at a time in front of their homes while the car-owner is in some other locality where laws prohibit vehicles from standing in one place for more than a specified time. Nearly all of the large cities of the United States have enacted legislation which allows a vehicle to stand in the business district for but 30 minutes. Anticipating the inconvenience that such regulations would cause car owners who do not employ chauffeurs, the Electric Vehicle Association of America has introduced a system for parking electrics which has succeeded so well in Chicago that practically all electric garages there have entered the service. The vigorous enforcement of the thirty-minute law forced many women who were accustomed to driving their own electrics around the loop to abandon their cars for use while shopping. While a portion of one of the parks in Chicago was thrown open to the public for use as a parking space, it was too remote from the shopping district to be of any great service. Therefore the downtown electric parking service idea had its first conception as a remedy for the existing conditions, and at the same time to give to the passenger electric vehicle the distinction

of possessing a service which is not available to any other type of car.

The matter of expense being prohibitive for each electric garage alone to maintain a parking station, three of the largest cooperated, and through the efforts of the Chicago section of the association a station was started with headquarters at the electric shop of the Commonwealth Edison Company. Patrons leave their cars at the station designated and receive a key tag which states plainly that the service is accepted on condition that same is entirely at owner's risk. The car is then parked by a competent chauffeur and returned at the time specified by patron. There is no charge to the customer for this service.

The licensed chauffeur is maintained at \$12 a week, each garage paying its proportion of the expense. The idea became so popular that three more garages applied for the service and a second station was started. The manufacturers having offered to cooperate, and with the addition of numerous other garages, the weekly cost of each garage for the service will probably fall as low as \$1.

Co-operation for Electrical Development

The Electric Vehicle Association is working very closely with the Society for Electrical Development in connection with their Electrical Prosperity Week development which is meeting with such general success.

It is expected that electric vehicle parades and sociability runs will be held in a number of cities especially those cities where the Association has its sixteen sections, during the week scheduled for November 29-December 4. The association is also co-operating with the Society in connection with its general publicity work embracing some unique motion picture advertising schemes in which electric vehicles form a conspicuous part.

Ohio Opens New Branch in Chicago

Ohio Electric Car Company, Toledo, Ohio, has entered its new headquarters in Chicago, at 1509 Michigan avenue.

J. H. Horsley, formerly special factory representative for the Ohio company, has been placed in charge of the Chicago branch.

The Ohio electric is well known in Chicago and from present indications, it is expected that the branch will develop a large clientele of satisfied users.

ELECTRIC PARKING SERVICE

OWNER.....

ADDRESS.....

LICENSE NO. CAR.....

GARAGE.....

BY.....

SUBJECT TO CONDITIONS ON BACK HEREOF

THIS SERVICE is accepted upon the condition that same is entirely at owner's risk.

Under the Auspices of the

Chicago Section

Electric Vehicle Association
of America

REWARD if returned to

ELECTRIC SHOP

Michigan and Jackson Blvds.

Back.

Parking Service Pass Issued by Chicago Garages.

Front.

Time Payments Applied to Motor Trucks

The Advisability of Permitting Credit on Commercial Vehicles Compared With Passenger Cars

THIS paper will treat the subject of time payments only as applied to the sale of commercial motor vehicles.

By **WALTER E. PARKER**

After close analysis of the conditions governing the sale of motor trucks, many have come to the conclusion that the stringent rules in practice, and I may say necessarily in practice, in connection with the sale of automobile pleasure vehicles, in so far as cash payment in full is required from the purchaser at the time of delivery, cannot be applied, in my opinion, to the commercial vehicle branch of the industry if that branch is to rapidly arise to anything like the development attained by the automobile pleasure vehicle. In a very large part the pleasure vehicle caters to the innate desire for luxury; and further caters to the habit of extravagance; which financial economists have always told us is inherent in the American character.

The commercial vehicle, on the other hand, does not cater, except in a very small part, to either of these characteristics, while it undoubtedly has a very large advertising value for a merchant, as being proof that he is up to date in his desire for modern business equipment; it certainly has no appeal to what is termed "American extravagance."

Manufacturers and dealers can only approach the ultimate consumer on the sure ground of economy and efficiency, using these as necessary arguments to enable him to dispose of his wares to him, to enable the purchaser to cut down his expenses, modernize his transportation methods, and thereby increase his business. In other words, we get to the purchaser by asking him to purchase an article of modern business equipment. To a certain extent a motor truck may be classed with cash registers, computing scales, cash carrying systems and other devices with which you are all familiar which go to make up the necessary facilities of modern business.

The growth of the motor truck industry, as compared to the pleasure vehicle industry, has been slow. One of the arguments with which the dealers have been met, almost invariably, I believe, has been that the merchant, who may be in very excellent financial standing and who obtains credit because of that financial standing against his purchase of merchandise, can purchase, because of that credit, any of the other modern business devices required in the use of his business; in many cases upon deferred time payments of such duration that he is enabled to pay their cost in some part through the savings made by the use of these devices; and he naturally demands, and has same right to expect the opportunity of buying a truck also on credit. From investigations I am confident that the motor truck industry will grow very much more slowly if the rules governing the sale of pleasure vehicles are rigidly adhered to.

However, if some means can be devised whereby motor trucks may be put in service under conditions of payment which will remove the difficulty surrounding their purchase by the average American merchant, we would very soon see an increase in the use of motor trucks. This very increase will make them, as it were, fashionable, and the merchant who does not

use them will be considered as being not up to date and not possessing proper equipment to transact business.

The question of time payments has been a bugbear to the automobile industry from its inception. You are familiar with the stand taken by the banks of this country some years ago when the claim was made that the automobile was such an extravagance that it was depleting the savings banks accounts of people who could not afford to own a motor car; creating extravagant ideas and altogether wrong from the standpoint of financial economy. These same financial guardians will unhesitatingly combat, with all the force at their disposal, the idea of selling pleasure vehicles on time, which would increase the danger of putting more of the American public in pawn to their love of luxury and display.

However, when we approach the question of selling motor trucks on time, these financial guardians cannot criticize for the same reasons. We are making it possible for a merchant to do more business at a lower cost and to earn more profits. Therefore, I submit that the bankers, with whom the dealers of this country do business, should be willing and glad to aid the dealer in disposing of goods on a credit basis, providing always that this credit basis is surrounded by sufficient safeguards to prevent any financial loss to the dealer, the banker or the purchaser.

Some time ago we inaugurated in several cities a plan to sell trucks on a time payment basis. We offered them on the following terms:

Thirty-five per cent down and the balance in ten equal monthly payments, the deferred payments being secured by a conditional bill of sale or chattel mortgage on the truck sold, the truck being insured against fire, theft and collision in favor of the manufacturer in so far as its interests would run.

In looking over our records, I found that if this plan had not been used in the particular instances not one-third of the sales would have been effected.

On these trucks, numbering one hundred and fifty-three, we have received payment in full with interest at 6 per cent per annum for all, with the exception of nine. On the latter we received the initial cash payment and a portion of the balance. The merchants to whom they were sold either went out of business or failed, and we were obliged to recover the trucks which were held for security for the balance of the payments. The security recovered has in every case but one been sufficient to take care of the balance due. I may say that out of the total business done, amounting to over \$150,000, the actual amount which may be charged off as money lost is less than \$200.

I think that truck manufacturers of the country have, as a whole, not been working in accord with the dealer on the matter of time payments. I believe we have all feared to approach the subject because of the fact that to a certain extent even a discussion of it with our dealers meant a letting down of the bars, and that we would place an argument before dealers which they might use to trade with us if we even discussed it.

We have rather brusquely told our dealers that if they had to sell goods on time payment it was up to them. I believe, however, that the time has come when it is necessary for the truck manufacturers of this country to face this matter in a more tolerant fashion, provided, of course, that the truck manufacturers desire to do a larger business and to increase the demand for motor trucks immediately.

I do not wish to appear as holding a brief for the dealer, but I submit to manufacturers that I think, to some extent, consideration is due the dealer. It is an open secret that the manufacturer does not pay cash in advance for the material he uses in his trucks; he obtains credit to some extent. It is true we obtain credit as manufacturers only where our financial standing entitles us to such, but I believe that where a dealer is entitled to credit (and many dealers undoubtedly are), if we do not grant it that the best interests of the truck business as a whole will suffer. It is up to us as manufacturers to give the question of time payments sufficient thought, and by our united efforts endeavor to make it possible to immediately increase the use of trucks by a concerted action regarding time payments.

A time payment plan to be successful should be along hard and fast set lines and be joined in by all manufacturers. It should mean initial payment on list price at all times of a fixed per cent of the purchase, in no case less than one-fourth, and it should mean that the entire balance due must be paid in not less than ten months. This will preclude price-cutting; it will prevent foolish competition. If all manufacturers will join, it will remove many of the evils which the trade is facing today. All the manufacturers with whom I have conferred regarding this matter have been unanimous in acknowledging the need of some plan, and have agreed with me in saying that this is a very desirable end to attain, but they add, "How can it be done?"

Factories who require their own credit standing to enable them to finance their business certainly can not provide credit facilities for their dealers. For any individual or company alone to adopt that as a general policy would require enormous capital and would invite disaster. To get the matter up for discussion and to initiate a suggestion of plans, some one of which can be made of mutual benefit, I submit one which I have worked out.

Before going into its minute details I wish to have in your minds the method under which the insurance business is conducted. I speak now of fire insurance. You know of companies carrying risks probably ten times as great as their entire capital and surplus, but these same companies, by reason of the fact that their chance of loss is so widely distributed, can safely do this, and it is with this thought in mind that this plan is submitted.

The plan submitted doubtless lends itself to modification or amplification, but I submit it as being feasible, and if it does nothing more than lead to a discussion which will develop some results along this line, I will be amply repaid for the time spent on it.

PLAN

MOTOR TRUCK CREDIT GUARANTY ASSOCIATION

(Proposed)
(Section 1)

PURPOSES

(a) To co-operate with motor truck dealers and manufacturers to mature the existing and tremendous latent motor truck sales field; and,

(b) Through a closer co-operative relationship between dealer and manufacturer, develop and maintain a bulwark of public good will for future mutually profitable business.

(Section 2)

METHODS

(a) To guarantee and finance deferred payments on purchases of motor trucks.

(b) To discount notes representing such deferred payments.

(Section 3)

PROPOSITION

It is proposed that a corporation be formed to be known as the MOTOR TRUCK CREDIT GUARANTY ASSOCIATION, as follows:

(Section 4)

CAPITAL

The capital to be \$500,000. Shares to be \$100, par nonassessible.

(Section 5)

DIVISION

(a) \$250,000 of the subscribed capital stock to be taken at par by motor truck dealers, hereinafter termed "dealer members."

(b) \$250,000 of the subscribed capital stock to be taken at par by motor truck manufacturers hereinafter termed "manufacturer members."

(Section 6)

NOTES, HOW ISSUED

(a) Notes issued for the purchase of new trucks built by "manufacturer members" and placed by "dealer members" only shall be bought or sold by the association.

(b) Notes issued for the purchase of motor trucks in accordance with paragraph (a) sec. 6, and according to the following terms only will be bought or discounted by the association.

(Section 7)

TERMS

(a) All trucks sold to the consumer on a deferred payment basis by "manufacturer members" or "dealer members" alike, shall be on terms as follows:

(b) Upon delivery to consumer one-fourth of purchase price to be paid in cash.

(c) The difference due, or three-fourths of purchase price, to be paid in ten monthly equi-instalments, represented by ten notes upon the correct form (said form to be furnished by the Association), bearing interest at the rate of 6 per cent per annum.

(d) Aforesaid notes to be covered or secured by conditional bill of sale or a chattel mortgage upon trucks so sold.

(e) Said trucks to be insured against fire, theft and the usual property damages, in favor of the association (to the extent of its interest).

(f) The notes representing the deferred payments to bear also the endorsement of the "dealer member" making the sale and for whom the notes are discounted.

(g) Notes only conforming to the terms above described shall be discounted or purchased by the association.

(h) The association shall have the right to refuse any notes offered for purchase or discount when its credit department is dissatisfied with the credit or financial standing of the original maker of such notes, or

(i) When notes already purchased from or discounted for the "dealer member" shall have become in arrears.

(Section 8)

RESTRICTION

Notes in payment for used trucks shall not be purchased or discounted by the association.

(Section 9)

MANAGEMENT

The management of the association shall be conducted by those appointed by a board of directors elected from the ranks of the association by its members, according to the by-laws of the association.

(Section 10)

VOTING POWER

"Dealer members" and "manufacturer members" shall be entitled to one vote apiece regardless of respective holdings.

(Section 11)

MEMBERSHIP

In order to obtain registered entry into the association it is essential

(a) That the "dealer members" each subscribe and pay in full for five shares of stock.

(b) That the "manufacturer members" each subscribe and pay in full for twenty-five shares of stock.

(Section 12)

TRANSFERS

"Dealer membership" can be sold or transferred only if all notes purchased or discounted (bearing "dealer member's" endorsement) have been paid in full, the purpose of this being that

the value of the "dealer membership" shall be a guarantee as far as its value goes, to the association for the payment of any liability which may accrue from the "dealer members" to the association.

(Section 13)

OPERATING FUNDS

It being desirable that the necessary operating funds of the association be derived from other sources than its paid in capital, the following nominal charges shall be made to members using the service of the association in discounting or selling notes:

(a) Two per cent of the consumer's purchase price on any truck sold on deferred payments (discounted by the association) shall be paid into the association by the "dealer member" who makes the sale, and requires the association to discount the notes.

(b) Two per cent of the consumer's purchase price on any truck sold on deferred payments (discounted by the association) shall be paid into the association by the "manufacturer member" whose product is represented in such a sale.

(c) From these receipts shall be deducted:

- (1) The operating expenses of the association, including bad debts, advertising, legal expenses, etc.
- (2) A sum equal to seven per cent for a reserve or surplus account.
- (3) A sum equal to seven per cent for dividends on the paid in capital of the association.

(Section 14)

REFUNDS

The foregoing charges being met, the balance in the operating account is to be returned to the "dealer members" and to the "manufacturer members" (who paid it into the association) pro rata, according to the amount paid in respectively.

(Section 15)

EXAMPLE

Assuming the "dealer member" sells trucks on deferred payments to the number of 2,500 at \$2,000 each, during a twelve-month, the notes being discounted or purchased by the association, the gross list sales would equal \$5,000,000.

The "dealer members" pay the association.....\$100,000
The "manufacturer members" pay the association..... 100,000

Total receipts\$200,000
making a total credit to operating account of two hundred thousand dollars.

Out of this the association will pay:

Operating expense (estimated).....\$30,000
7 Per cent paid in capital..... 35,000
7 Per cent on surplus account..... 35,000

Total deductions\$100,000
leaving a balance of \$100,000 to be refunded to the "dealer members" and to the "manufacturer members" who paid the association for its service in discounting notes on deferred payments. This would be refunded to the "dealer members" who paid the association for the service of discounting notes on deferred payments to the amount of \$50,000 out of the \$100,000 originally paid by them on sales amounting to \$5,000,000, or one per cent on their sales.

The "manufacturer members" will also have \$50,000 refunded out of \$100,000 they have paid in, leaving \$50,000 the "manufacturer members" have paid on sales amounting to \$5,000,000, or one per cent on their sales.

(Section 16)

POSSIBLE BUSINESS

It is safe to say that instead of a total business of \$5,000,000 the association should do at least \$10,000,000 worth, and the consequent refund to the "dealer members" and to the "manufacturer members" should be so large that their net cost will be very much below the low percentage given.

(Section 17)

NON-SALARIED OFFICERS

It is suggested that neither officers or directors, as such, be paid salaries, but that they be allowed traveling expenses and a per diem fee for attendance at the necessary meetings of directors and executive committees.

(Section 18)

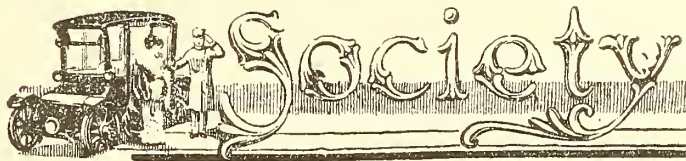
SECURITY AGAINST BAD DEBTS

The bad debts should be almost nil—because it has for security—

- (a) The maker of the notes, whose credit must be found.
- (b) The security of the "dealer member's" endorsement.
- (c) The collateral security of a chattel mortgage on the trucks, the debts against which diminish monthly.

Electrics Illustrate Society Columns

Day Baker, manager agency and central station department of the General Vehicle Company, commenting on the popularity of the electric vehicle, especially in the West, calls attention to the fact that many of the newspapers which run society columns, show an electric vehicle in connection with the title.



Another fact which has not been commented on by the electric vehicle interests is that E. Phillips Oppenheim, the novelist, always arranges that all his diplomats and all his society ladies arrive at their destinations, or are called for by an electric roadster or an electric brougham.

From Buffalo to New York in an Electric Vehicle

Considerable interest has been evinced in the across-state trip made recently by Charles Chamberlain, of Buffalo, N. Y., in a Waverley Electric. It was the pleasure of A. Jackson Marshall, secretary of the Electric Vehicle Association, to meet Mr. Chamberlain upon his arrival in New York at the completion of the trip from Buffalo to New York via "electric" and to hear his interesting account of the trip.

Mr. Chamberlain's original plans indicated that he would make the entire trip, 504 miles, in three days. However, due to the exceedingly poor charging service facilities in Albany and Poughkeepsie, he was forced to remain in Poughkeepsie over night, thus requiring a day to complete the trip. For the most part Mr. Chamberlain said he found excellent charging facilities in the upstate towns, where he obtained service immediately, enabling him to live up to his schedule. There were many rough roads and several very bad hills, which, however, were negotiated with comparative ease. At one particularly difficult grade Mr. Chamberlain related a rather amusing incident. It was a very steep hill filled with deep, fresh earth, which more than one gasoline car had failed to take. Several onlookers congregated to watch the performance of the smart looking luxurious electric, and a touring car stopped also, evidently waiting to see it get stuck. But nothing of the kind! The electric sturdily plowed its way right to the top of the hill without any apparent effort, leaving the doubtful onlookers in a state of surprised admiration.

Ninety-four kilowatt hours were consumed in covering the 504 miles, or an average of .18 kwhs. per mile. This represents less than one cent per mile for the distance covered.

Mr. Chamberlain feels that his trip was a great success. That he did not make it in the three days originally planned was due primarily to the inadequate charging facilities in Albany and Poughkeepsie, and partially to extensive detours made necessary on account of road repairs. With anything like good charging service in the aforementioned cities, Mr. Chamberlain would easily have negotiated the trip in schedule time.

New England Section N. E. L. A. Report

Electric Vehicle Committee Reviews Electric Vehicle Development in New England

AN interesting report was presented to the recent convention of the New England section, National Electric Light Association, by its electric vehicle committee. Covering New England conditions the committee presented a tabulated list of rates for charging in both public and private garages, which showed that in the former rates range from 3 to 6 cents and in the latter from 3 to 15 cents, a rate of 5 to 6 cents predominating. Rates in garages range from 5 to 10 cents, and in charging stations maintained by lighting companies from 3.5 to 10 cents, 5 and 6 cent rates predominating. A sub-committee has secured the suspension of a rule of the Massachusetts district police that no rectifiers be installed in gasoline garages except when installed in fireproof compartments. The provision now is that no sparking point is within four feet of the floor.

Attempts to secure a uniform charging rate have met with some success. A sub-committee on relations with central stations reported that the initiative in campaigns for popularizing the electric should be taken by the manufacturers, the station being ready to supply current free for demonstrations and make contributions for local advertising. About a dozen central stations in New England are carrying on especially effective propaganda. Others are willing to contribute time and money for definite objects in advancing vehicle interests in their territory. The secretary of the New England section, N. E. L. A., keeps a list of garage and battery men, drivers, etc., for the use of central stations. The office at 149 Fremont street, Boston, is a clearing house for vehicle information.

The report alluded to the electric mail-car fleet in Boston already described in a recent issue, and stated that the electric is increasing in other lines of business, especially in connection with mills and factories. It was recommended that an electric-vehicle committee be continued, to advance the work started and to complete the plans already formulated.

S. Fred Smith, manager, Salem (Mass.) Electric Lighting Company, stated that his company is doing all its operating work with electrics. Garaging is furnished the public free, with a competent battery man in charge. A baking company which recently extended its business to Salem has substituted an electric truck for a gas car for transporting product from Boston, about sixteen miles. The truck makes the run, exchanges batteries at Salem, and returns daily.

A. B. Lisle, Providence, R. I., stated that records of comparative costs show that of electrics to gasoline as being in the ratio of 7 to 12. A local department store recently invested \$35,000 in trucks and will eliminate gasoline cars entirely.

E. P. Rowell, Plymouth, Mass., said the electric is increasing in his territory. His company furnishes energy to a public garage.

W. M. Thayer, Hartford Electric Light Company, presented the following record of costs for delivery by horses, gasoline and electric trucks used in the coal trade:

	Delivery Cost per Ton	Cost per Ton-Mile
Horse-drawn wagon	44.9 cents	15 cents
Horse-drawn log wagon	51.5 cents	14.1 cents
Two-ton gasoline truck	96.5 cents	14.8 cents
Two-ton electric truck	66.2 cents	13.8 cents
Five-ton gas truck.....	62.2 cents	12.4 cents

F. H. Smith, Worcester, gave the following daily costs of operation of electric vehicles employed by the Worcester Electric Light Company in various services in connection with operation. The figures include energy at 2 cents a kilowatt-hour, insurance, and depreciation at 20 per cent a year:

Two-ton truck for freight handling.....	\$6.13 a day
1,000-lb. line truck.....	4.25 a day
750-lb. service truck.....	3.58 a day
Runabouts, for supt. of service.....	3.34 a day
1,000-lb. truck	3.35 a day
One-ton truck	4.10 a day
Runabout, for inspector.....	4.10 a day
Runabout, supt. of distribution.....	4.18 a day
Line trucks	\$4.72 and 4.05 a day
7,000-lb. truck, with winch, for cable work.....	6.24 a day
Runabouts	\$3.10 and 2.81 a day

Day Baker, superintendent of sales, General Vehicle Company, New York, told of a two-ton truck in Spokane, Wash., which is operated by a baggage-delivery company. Average mileages per day for eighteen months have been 68 miles. At Hartford, Conn., an electric truck is successfully operated by a milkman who comes into the city from a considerable distance. Mr. Baker pointed out that the improvement in batteries and lessened weight of the chassis have resulted in greatly increased mileage capacities.

Ward Electric Making Long Cross Country Run

Excellent progress is being made by the Ward "Special" electric delivery wagon which is making the long cross country trip from New York to Cleveland, scheduled to arrive during the convention of the Electric Vehicle Association of America to be held in that city October 18 and 19. This vehicle started from the Grand Central Palace at 2.30 Wednesday afternoon, coincident with the opening of the annual Electrical Exposition and Motor Show. It reached Peekskill the same evening and on Thursday ran through to Albany.

According to the report of John Delahant, the expert of The New York Electric Vehicle Dealers Association, who is accompanying the vehicle as official observer, one hundred and eleven ampere hours of current were consumed in making the run from the Palace to Peekskill, a distance of forty-five miles, and at Ossining the battery was given a boost of eighty amperes for one hour, because it was found necessary to make a long detour away from the main road in order to reach Peekskill, this detour including bad roads and heavy grades.

On Thursday this Ward delivery wagon which by the way is carrying its rated capacity load of seven hundred and fifty pounds, made the run from Peekskill to Albany, stopping at Poughkeepsie to have its battery boosted. The mileage and current consumption for this day's run have not yet been received at the Ward exhibit in the Electrical Show.

Selling Passenger Electric Automobiles

The First of a Series of Talks Presenting Various Suggestions in Salesmanship

THE sales department of the average manufacturing company is probably its most important factor, for upon this unit depends the disposal of the manufacturer's product and the return of the initial investment with the desired profit. That is, the selling staff is the earning power. Especially is this true in the automobile industry, because however excellent the particular product, success depends wholly upon the ability of the sales organization to turn the product into available money to be utilized in further manufacturing.

BY B. FRED SCHAFER

In the electric car division of the automobile industry this is particularly emphasized and very well evidenced by the fact that so many inferior products have at one time or another, and in some instances do at the present time, enjoy notable success merely because of efficient, systematic and wide-awake selling staffs, well trained and determined. In such organizations each factor works in close co-operation with certain fundamental features which are essential in successful salesmanship.

Selling electric automobiles is very much like selling matches. A match is a match, practically the same in construction, in general appearance, weight, size, ability and utility. Yet we are thoroughly aware that some matches, even though practically identical in all features with other matches, are satisfactory; whereas on the other hand, some matches are inferior and practically worthless. As a parallel case, standardization, similarity in appearance, few parts and general simplicity in practically all types of electric cars have made it difficult for the average layman to discriminate between them. Yet, as in the case of the matches, there is a difference; and if this difference is not ascertained, the buyer may find he has made an undesirable purchase. Success belongs to him who can make clear to the prospective buyer this essential difference, and simultaneously preserve the prospect's confidence by diplomatically making comparisons, which offer ample opportunity to criticize weaknesses existing in the competitors' models, and elaborating on improvements in his own models, rather than by "knocking," invariably instigating a doubt for the type in general.

To discriminate successfully means not only to indicate a difference but to prove that such difference is a weakness existing in the competitors' product, but not in the particular type solicited; for this is a day of "show me" and "prove to me why I should buy yours and not his." The day of the handsome salesman with a pleasing personality, a dinner, a drink or cigar, a good story, and a little smooth sales talk, has gone by. Today the public not only wants the best of its kind for the money but insists that it be satisfactorily proven to be the best.

Now that we have introduced the most important factor in selling electrics—successful discrimination—we will first determine just what methods and policies to employ in preparing one's self to discriminate properly.

In the analysis of this fundamental principle a

thorough knowledge and adaptation of the following sub-principles are necessary. First, a thorough knowledge of your own car including every feature from the process of treating the steel in the chassis construction to the method of putting on the last coat of paint in a properly heated and dust-proof drying room. Included in this must be an accurate knowledge of every integral part, its absolute purpose, relationship to other parts, and in fact, just why the manufacturer and designer deemed fit to produce each part as it is.

Having a thorough knowledge of the entire car and what it will do in speed, mileage, long life, etc., the second step is the study of other models offered by every competitor in the industry.

To arrive at perfection each model should be as thoroughly studied and investigated as the model which you are selling. Proper discrimination can never be secured until a true and complete comparison is made of all parts which are common to competitive models. Equipped with an accurate knowledge of all models and all of the various methods of construction and operating principles in models manufactured by your competitors, it is quite easy to learn to discriminate by making comparisons wherein weakness and strength will both be presented.

In the matter of drawing comparisons—the first step in discrimination—it is absolutely essential that such comparison be a thorough one, honest and just. That is, every part in common from the hub cap to the color of the varnish should be analyzed and a comparison drawn with equivalent parts in competitors' models. In this it would be well to keep a complete record showing every model manufactured, including your own, and a complete record of comparison of all elements in common.

Having the specifications, the principles and the mechanical features boasted by the respective competitive manufacturers, the next step is to determine just wherein your type excels those of your competitors. In this it is important that every prejudice be eliminated, every pet and selfish motive for your own type be forgotten, and every factor be carefully compared. After making an exact comparison, it is an easy matter to find the weak spots both in your own type and those of your competitors. If in your own type you find weaknesses not existing in other types, it should be your sincerest effort to recommend that such weaknesses be improved, and until such improvements are made your first duty should be in planning a satisfactory explanation overcoming such weaknesses; for you can rely on your competitor determining these as you have found those in his product.

The successful salesman not only knows the good features of his own car and the weaknesses of those of his competitors, but more important, knows the weaknesses of his own car and just how to defend them in case of attack.

With an accurate memory and clear understanding of the principles just discussed and in absolute faith that yours is the best of its kind that money can buy, you are now ready to study those important

branches of salesmanship which are preparatory to actual selling in the field.

APPEARANCE, AGE, SUAVITY, PERSONALITY AND ADAPTABILITY

In selling a high class product demanding a comparatively large expenditure, it naturally follows that the source of sales must originate in a type of buyer accustomed to a high class article, and financially capable of paying the list price. To exploit your product to this type of clientele the representative must be thoroughly trained and accomplished, first to secure an interview, and in his interview to create a favorable impression.

Creating a favorable impression on the prospective purchaser is winning half the battle; a respectful audience once being established permits ample opportunity to present and exploit your product.

In this world of many individual and differing traits of human nature, many elements enter into the psychology of establishing a favorable impression from which the prospective purchasers' mental attitude is properly molded to permit sales talk. This is especially true in selling electrics because eighty per cent of the prospects to be interviewed are women who have their first impressions on the above mentioned factors.

Personal appearance probably ranks first among the necessary requisites, because opinions are first molded from the very first impressions of sight. The salesman who is immaculate in general appearance, erect and absolutely assured, evinces an atmosphere of prosperity, character and honesty. The prospect to be interviewed takes in at a single glance these features which demand his attention, respect and further audience.

Once introduced, in the few seconds preceding a general statement of the sense of the interview, the salesman undergoes automatically a second scrutiny which invariably represents the prospect's attempt to ascertain every possible feature which might reveal the nature of the interview and its weight is important. Age, so easily approximated, is the only possible self-revealing feature. The successful salesman must be old enough to offer favorable speculation from the prospect as to the importance of his mission.

Having once created a favorable impression and the undivided attention of the prospect, the third impression is formed from the first actual statement made in introducing sales talk. In this the salesman must be free from temerity, yet open his conversation firmly and confidently. The genteel, trained salesman, suave and absolutely self-possessed, can eliminate any existing feeling of antagonism and persuade the prospect to enter into a conversation preparatory to launching his principal issue.

With an impression thus far unchanged by further scrutiny or newly developed disfavor from the prospect, the salesman in advancing his selling talk should invariably exhaust every possible effort to preserve the value of his favorable impression as established. Peculiarities of personality exhibited even after successfully negotiating an interview, have often changed the entire nature of a prospect's attitude. Although the virtue of personality is naturally developed to greater degrees in some than in others, he who expects to become efficient must train himself in its every channel in order to secure that pleasure of acquaintance and confidence in his statements which transmit thoughts of security and legitimacy.

In many instances the salesman finds his prospect

of most peculiar and eccentric character. The ability to adapt oneself to confront any condition arising is a most valuable feature. It is generally more diplomatic to appease peculiarity rather than conquer it.

SECURING A PROSPECTIVE CLIENTELE

When an electric car salesman has become familiar with all those features just discussed, he is ready to develop a field in which to exploit his product. Securing actual prospects for electric cars is very much like selling stocks, bonds or other securities. In either instance the product is limited to a certain field; those who possess wealth. That is, the clientele of prospects who you establish must be financially able to purchase.

Having this principal thought in mind, the next step is to choose just who to interview. In this it might be well to make general divisions under the headings of men, women, and men and women, for in many instances the man of the family is the only automobile enthusiast, while in other instances the wife, mother or daughter desires an automobile, the father, brother or husband being uninterested; and still again instances where neither man nor woman could be sold until both had been equally interested. This is not the case in selling gas cars where ninety-nine per cent of the vehicles are sold directly to the man.

In the gas car field the average person is a probable prospect.

Electric vehicles are best sold to the "upper classes;" those who have certain business and social relations which make their names easily obtainable. For instance, when first compiling a list of prospects it is well to learn from what sources a list of men and women of high standing can be obtained. These are presented here and offer probably every legitimate source of finding a probable buyer:

1. Personal and telephone calls at sales headquarters.
2. Present owners of electrics, especially early models.
3. Garage prospects.
4. Owners of high class gas cars.
5. Doctors and professional men.
6. Clubs, lodges, country clubs, etc.
7. Women's social clubs.
8. All accessible lists of high social standing attendance.
9. Principals in companies employing electric trucks.
10. Weddings announced.
11. New heirs of large estates.
12. Inheritance tax lists.
13. Insurance endowment expirations.
14. Principals in competitors' demonstrations.
15. Lists of friends of satisfied owners of your own type.
16. Personal social standing and friendships.
17. Newspaper classified advertisements.
18. Private hotel lobbying.
19. Electrical engineers, etc.
20. Paint, overhaul and repair shops.

(To be continued.)

It is hoped that the greatest possible number of members of the Electric Vehicle Association, whether members or not, may be present at the sixth annual convention which will occur on Monday and Tuesday, the 18 and 19 of October, in Cleveland, Ohio, at the Hotel Statler.

Field for Medium Size and Small Trucks

Smaller Vehicles Make More Frequent Trips and Increase Ratio of Pay to Non-Pay Load

BY E. S. FOLJAMBE

IN pointing out the field for medium size and small trucks, it is

done with the belief that the commercial car industry today is suffering from a lack of appreciation on the part of the manufacturer and the agent, of the importance and extent of this field. Lest there be a misunderstanding, it must be pointed out at the beginning that it is the object not to belittle the sphere of the larger unit, but to emphasize the extent of the field for the small unit, and earnestly urge the manufacturers to devote at least the same amount of attention to this opportunity that they have in the past to the development and sale of large trucks.

Let us class, for the purpose of this article, 1,200 to 2,000-lb. trucks as medium, and under 1,200 as small trucks.

Before attempting to segregate that portion of merchandise transportation as within the scope of the medium size and small truck, it may be well first to view the field as a whole.

Motor haulage as yet has not even dented the surface of the hauling of the country. The freight now carried in the United States alone by railroads, steamship companies, horses, and motor vehicles, is over two billion tons a year. The horse is fast being displaced by the growth of mechanical appliances. This is an age of Titans. We have graduated from the wheelbarrow and spade to the motor-driven truck and steam shovel. We are now only at the beginning of the age of the introduction of motor power for muscular power.

Prior to the introduction of the parcel post the Interstate Commerce Commission compiled figures on merchandise transportation. From these government figures it has been deduced that of the total volume of transportation in the United States, the steamships and railroads combined handle but 15 per cent, leaving the other 85 per cent to be moved by horse and wagon or motor-driven vehicles. Yet during exactly the period representing the introduction and growth of power-driven vehicles, namely, from 1900 to 1910, the government statistics show an increase of 1,566,000 in the number of horses in use on our farms, or 8.6 per cent. At this rate of increase, and with 19,833,113 horses in 1910, there should now be in use approximately 20,000,000 horses. Mules, burros, and other draft animals have increased during the same period 11.7 per cent, making the total number now in use 4,247,800, or a total of over 24,000,000. This does not take into consideration the 2,000,000 or more horses in cities. At the same time the average price of the horse has increased from \$53 in 1900 to \$112 in 1910, and of mules from \$64 to \$131.

A realization of how little inroad the truck has already made is borne in upon us when we consider the following figures: From 1908 until the present time, inclusive, there have been produced in the United States approximately

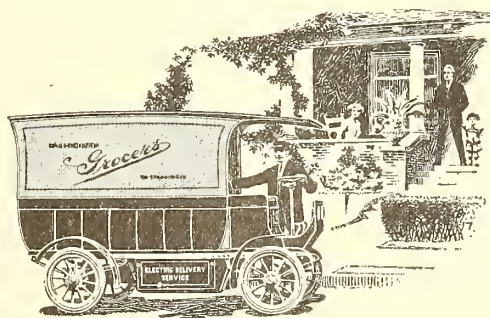
180,000 commercial cars. One hundred thousand to 125,000 of these are probably now in use. On an average, counting all sized vehicles, these do not displace more than three horses each, or a total number of horses displaced of not over 375,000. When this number is compared to the total number of horses and draft animals in use it is found that commercial cars have in reality displaced less than 1.5 per cent, and even taking into consideration the motor-driven farm tractor, the possible field still not covered is fully 98 per cent.

THE LINE OF LEAST RESISTANCE.

It is but natural that the development and application of large trucks came first. This was the line of least resistance for the makers. While trucks were still in the experimental stage the heavy hauler, the man who was having great difficulty in doing his work with horses, was the first who was willing to take a chance on an experiment. How successfully his experiment has worked out has been shown by the tremendous growth of the sales of large trucks for heavy hauling. Manufacturers who later entered the field, noting the early successes of the large truck, followed suit and gradually the competition between the makers became unusually keen for this class of hauling. The result on the industry is clearly shown by the remark of a sales manager handling large trucks in New York City, when he said, "There are only about 500 possible purchasers in the metropolitan district, and fully 250 truck salesmen, each making in the neighborhood of ten calls a day, are soliciting their trade." Even from his point of view as a large unit distributor, his estimate of purchasers is undoubtedly low, but the truth of his remark concerning the small circle in which the truck salesmen are working is all too evident. Unfortunately, the 35,000 or 40,000 possible commercial car users in the metropolitan section go unsolicited, simply because the vast majority in the production and sale of motor-driven vehicles have been concentrating their entire effort on the sale of large capacity trucks. We have now reached the stage in the merchandising of trucks in which the makers must also reach out into the world of the one and two-horse user.

Some will claim that the field for the small vehicle is already filled and being ruined by the sale and conversion into commercial cars of large numbers of second-hand pleasure vehicles. My investigation of such users has almost invariably shown these owners to be dissatisfied with results and ready and willing purchasers of a real commercial car just as soon as they find anything at all suitable for the work at a low price. Instead of injuring the small delivery car field, these instances are but the indication of a demand on the part of users for just such small cars.

Another and not to be disregarded weather vane is the ever-increasing number of gas cars that are



yearly stripped of their passenger bodies at a loss and fitted with commercial bodies. This demand for a small, cheap but capable delivery unit has become so great and has been so persistent that certain companies have at last announced that cars will be sold without bodies if desired. Various estimates as to the number of such converted cars have been made, but authentic figures cannot be obtained. Nevertheless these would indicate that from 60,000 to 80,000 are yearly fitted for commercial uses, showing conclusively the enormous demand that even now exists in this small car field. Unquestionably a large percentage of these purchasers would buy an out and out business car if the market afforded equally staunch and serviceable vehicles at as low a price. In other words, the demand now, as expressed by the converted car, is so great as to actually equal the output of all the commercial car makers this year.

SMALL TRUCKS DEVELOP THE USER.

In developing the small unit users, the benefit to the maker of large capacity vehicles must not be overlooked. The sale and introduction of the small truck will undoubtedly have a marked beneficial influence in increasing the sales of the larger vehicles. Thousands of possible users of one or two large capacity trucks can never be sold until they have been developed to a knowledge of motor haulage and delivery by the use of smaller and less expensive delivery units.

Many estimates have been made as to the proportion of the total haulage which comes within the field of the medium and small truck. These figures variously estimate that from 75 to 80 per cent of all merchandise transportation, aside from that cared for by steamships and railroads, can be handled by the smaller vehicle, leaving but 20 to 25 per cent for the large truck. Yet the production of vehicles has until recently been almost in inverse ratio.

Stability in the industry can never be reached until cars are produced much more nearly in proportion to the demand.

"TRANSFER" AND "DELIVERY."

This work of motor-driven vehicles may be roughly divided into "transfer" and "delivery." By transfer is meant the movement of maximum loads from one point directly to a destination without lessening the load, such as the transfer from farm or factories to railroads or steamships, from mine to smelter, from stores to distributing points, etc. This class of haulage has been developed by the large truck to a high state of efficiency but the average of even this class of load has been shown to be in the neighborhood of but 4,500 pounds.

By delivery is meant distribution of goods to numerous consignees in which case there is an ever-diminishing load upon the vehicle, and almost at no time does it carry its maximum. This is the field for the medium and small-sized truck, and embraces from 75 to 80 per cent by volume of all merchandise transportation.

Transfer includes the raw product, while delivery concerns itself usually with the finished product. The total tonnage handled is practically the same, but the volume is vastly greater, the finished product as a rule occupying many times the space of the raw material. This necessitates a large number of delivery vehicles of large volume but small load capacity, as compared to those required to handle the unfinished

product. This is shown by almost any line of manufacture: Lumber to furniture or household utensil, iron to stoves, steel to cutlery, shoe findings to finished leather goods, clay to dishes, flour to bread, etc.

SURPRISING FIGURES ON AVERAGE LOADS.

In regard to the weight of average loads in the "delivery" field, there is much ignorance even on the part of the users. Reference again to interstate commerce figures may be enlightening. These show that 95 per cent of all parcel delivery packages handled in this country come under 50 pounds in weight. Investigation by a New York firm making a specialty of analyzing delivery methods showed the average of all loads for retail distribution to reach the astonishingly low figure of 550 pounds.

The following figures are from a study of the weight of loads made by a large department store of Philadelphia during a rush period. For package delivery this company, and it is not alone, employs a vehicle weighing 4,000 pounds, with a rated capacity of 3,000 pounds. A careful analysis showed the loads to range from 800 pounds to a maximum of 1,195 pounds, with the vehicle body piled just as full as it could be packed. This body was 9 feet long, 56 inches wide, and 78 inches high. The total load moved by the motor with the maximum pay load on the vehicle was 5,195 pounds, the payload representing but 23 per cent of this total weight, while the dead load moved is represented by 77 per cent.

A study of one of the largest candy companies of New York City showed the following results, motor-driven trucks during the normal period carried as follows: 22.3 per cent payload, and 77.7 non-paying load; another truck but 18.8 payload, and 81.2 non-paying load; another 24.7 payload, and 75.3 non-paying load, while the horse vehicles showed a payload capacity of 41.8 and 58.2 non-paying load. During a rush period the same cars showed 22.7 per cent, 23.5 per cent, and 29.8 per cent, or an average non-pay load of 74.7 per cent. The payload is a constantly diminishing one, while the non-paying load must be moved over the entire route. Conclusion, it costs too much to deliver the vehicle.

THE REMEDY.

The analysis of the ratio of payload to dead load shows that the remedy lies in a reduction in the size and weight of vehicle, more in conformity with the average loads carried and that more frequent trips with these more nearly capacity loads must be made.

The bodies play an important part in the use of the vehicle in its proper field. The Philadelphia firm's experience showed that a body 9 feet by 56 by 78 inches would not carry more than 1,100 to 1,200 pounds of the class of goods being handled, and that a smaller capacity vehicle fitted with such a body would be more economical.

IMPORTANCE OF THE DEALER.

Immediately, however, trouble will result by placing a body of large volume capacity on a smaller chassis, as the owner will in all probability use the vehicle for other and heavier commodities. The field for the medium-sized and small truck with large volume capacity body is there, but the application of the vehicle to this work must be carefully watched to prevent abuses and misuse, as damaging to the maker and the sale of trucks in general, as was the misapplication of the heavier unit with too light a load. To guard against this is the work of the agent. His

importance in the development of this enormous field for the medium and small truck cannot be over-estimated. There are few manufacturers today who still believe that they can build up a large and successful business without the dealer. The small truck being a quantity production proposition, the manufacturer is all the more dependent upon having a large number of personally interested dealers. This is borne out by the fact that no manufacturer has successfully marketed such a product through the medium of branch houses alone.

The demand that already exists for such small trucks has been demonstrated by the phenomenal growth of the sales of a 1,000-pound vehicle by a recent Philadelphia entry into the ranks of the small truck makers. This firm within five months reached a production and sale of thirty cars a week and is now, after seven months, completing an addition which will double its capacity. The immediate and overwhelming response from agents in all sections of the country is conclusive evidence of their belief in the field of the medium-sized and small truck.

The problem today in delivery is to increase the ratio of pay to non-pay load, and one of the best methods of accomplishing this is *by using smaller vehicles, making more frequent trips, with more nearly capacity loads.*

Edison Storage Battery Ruggedness

Some very interesting instances of ruggedness have been gathered recently in connection with rather remarkable service performances of Edison alkaline storage batteries.

On many occasions Edison batteries have passed through fires that have completely burned the wooden trays in which they were assembled, and have even melted some of the hard rubber insulation. Many of these experiences have resulted in only a temporary decrease in efficiency instead of complete annihilation, and after making the few necessary repairs the battery has been returned to work better than new. One instance of this was a fire in Indianapolis, that burned a garage to the ground. The next morning an Edison-equipped electric was run from the ruins on power supplied from its Edison batteries even though the body of the car was burned and the wooden trays in which the cells were assembled were badly charred.

Another trial by fire occurred in 1912. The 100-foot plunge made by a delivery wagon of the Purity Baking Company gave one more proof of Edison battery ruggedness when the garage of the electric light company of Cambridge, Mass., was burned and its contents practically destroyed. The remains of one Edison-equipped truck is shown in the illustration. With the exception of two cells in this Edison battery none were beyond repair—in fact, practically nothing had to be done except to insert new rubber parts when the cells were recanned.

Numerous instances are on record where the Edison batteries have demonstrated capacity to withstand severe vibration and concussion. They have passed through collisions with little more than a few dents in the steel containers and broken trays. An Edison-equipped delivery wagon owned by Bonwit, Teller & Company, New York, was jammed between a street car and the boulevard fence and curb at One Hundred and Eleventh street. The wagon was smashed and the fence was bent but the only damage done to the Edison battery was to split the bottom slat of one wooden tray.

Its latest demonstration of ruggedness occurred recently at Minneapolis. One of the 36 electric delivery wagons built and owned by the Purity Baking Company, of St. Paul, and equipped with Edison batteries, left the roadway of a bridge, mounted the sidewalk, crashed through the iron side railing and plunged 100 feet into the Mississippi. After it had been submerged for about 12 hours, the Edison battery was removed. Some of the steel containers were considerably bent and dented and the wooden trays showed the effect of the fall, but before any repairs whatsoever were made the Edison batteries was put on "bench test" and every cell was well above rated capacity (225 ampere hours) on a normal charge. The maximum capacity to one volt was 277 ampere hours and the minimum capacity (with the exception of one cell) was 247 ampere hours.

The experience of the Edison battery in the Omaha cyclone is another interesting incident. An Edison equipped Detroit roadster was buried under tons of brick. The metal hood of the car was crushed down on the battery, making a short circuit that burned off the "jumpers." When the report of this catastrophe was made and it was found that there was not one damaged cell in the lot, the customer said, "If a cyclone can't do it, what can?"

The Edison battery has been on sunken boats and lain for hours completely submerged in salt water, without injury. This feature is of very great value in submarine service and in combination with many other exclusive features led the United States Government to specify it on the L-8, the first submarine to be built in the Government yards. Also, it has been ordered to replace another make of battery on the E-2, a submarine which has given the Government much trouble.

Fire totally destroyed the shipyard of the New York Yacht and Engine Company so that there was not a semblance of a boat or building left. Before the fire there was a handsome 65-foot power boat in the shipyard about ready for launching, and it was equipped with 28 cells of Edison Battery. The Edison battery was in a mahogany box, and owing to its non-corrosive characteristics, was located on the deck. After the fire, the first objects to catch the eye as one approached the middle of the ruins were the 28 Edison Cells standing up on top of a heap of ashes, twisted iron and debris. The heat in the immediate neighborhood had been so great that it had melted the brass manifolds on two engines. The slate switchboard and instruments which had been installed about three feet from the battery were totally destroyed. The slate was reduced to small pieces of flake and only the fronts of the instruments remained. All of the bushings and hard rubber insulators of the Edison battery were totally destroyed. However, the connectors had not become loose and there was sufficient charred insulation in place to permit a test. Twenty of these cells when so tested showed an average of 1.3 volts, and the current available in the battery was sufficient to turn a No. 14 wire red hot in a few seconds.

On sea and land these sturdy steel structures have had many adventures in which they have proved themselves greater than circumstances. In the cold and blow of winter snow when blizzards have blocked street car lines and horses and gasoline cars have been stalled, electric vehicles equipped with Edison storage batteries have risen to the occasion and kept open the lines of transportation and communication.

This indestructibility of the Edison Storage Battery gives it additional value by decreasing its liability.

The Function of the Electric Garage

Presented at the Sixth Annual Convention of the Electric Vehicle Association of America

BY looking in the dictionary it will be seen that the word "garage" is derived from the French word "garer" the primary meaning of which is to moor a ship to the dock, so that literally, an electric garage is a mooring place for electric vehicles.

The object of this paper, however, is to show that the literal meaning does not apply, and that the place from which an electric vehicle is operated should be something more than a place in which it may be tied up over night.

Usually an electric garage is a place where electric vehicles are housed, charged and washed at a fixed rate per month without regard to the amount of work that the vehicle is called upon to do, but this is not all that a garage should be. The function of the garage is not only to give the vehicle proper care, but also to keep it in proper working order. In other words, its function should be to bring the electric vehicle within the reach of all vehicle users.

To perform this function the garage must be provided with whatever equipment is necessary for making all minor repairs at a reasonable rate and without unnecessary delay, and must also be in a position to supply electric power at a reasonable rate. In addition, therefore, to being a place in which the vehicle is housed, washed and charged, an electric garage that performs its functions is a place from which the vehicle can be operated economically. It relieves the vehicle manufacturers of the expense of maintaining a repair shop in connection with every selling agency and the vehicle user of the expense and annoyance of having the vehicle tied up while a bolt or a small piece of casting is being obtained from a distant part of the country.

With regard to the electric vehicle itself, operating data can now be produced to show that it is as good as perfect if what we are asking for is a vehicle that is in every respect superior to the vehicles now used for carrying on our street traffic. Much has been said about the electric vehicle in its own special field and the necessity of making a technical investigation of the character of the work to be done before recommending the use of electric vehicles, but we now know that such an investigation is unnecessary, that we need not ask whether the hauls are long or short, the streets good or bad, or whether or not the vehicle has to stand for half of the day at some railway station. It is only necessary to inquire about the garaging facilities and if the answers to these inquiries are satisfactory we need not hesitate to recommend electric vehicles for any kind of street traffic.

It must be admitted, however, that garaging arrangements are at present generally unsatisfactory. The various schemes of battery maintenance and battery service that we hear spoken about and the claim that electric vehicles will never be entirely successful until some such maintenance systems are established, go to show that at the present time batteries are not being properly maintained. In other words, that the garages are not performing their functions properly. The battery, however, is not the only part of the electric vehicle that has to be maintained, and a battery maintenance system alone will not enable the owner of an electric vehicle to operate it

BY R MACRAE*

to the very best advantage possible.

The lack of adequate garaging facilities cannot all be laid to our garage managers. Considering how little encouragement the electric garages have received from the manufacturers and the central station men, we may rather be surprised that our garage service in general is a good as it is. Where we have public garages they have sprung up to fill a want which the users of electric vehicles recognize, but which the vehicle manufacturers and central station companies generally speaking have not recognized. The shortcomings of the garages are almost entirely due to a general misconception of what the functions of the garage should be and to the fact that those who are interested the most in the development of the electric vehicle industry have not fully realized that public garages are necessary in order that the electric vehicle may become generally available. Had the need for suitable garages been clearly recognized at the outset it is quite certain that the electric vehicle industry would not now be lagging so far behind its competitors. Even now when urging the claims of the electric garage the question is sometimes asked "What have the garages ever done for the development of the industry?" If a man wants to operate an electric vehicle why go to a public garage? Why not start a private garage?

There are two reasons why the small garage cannot perform the functions of a garage satisfactorily. The first is, that it cannot afford to maintain an adequate equipment, and the second is the comparatively high rates per kilowatt-hour that the small garage has to pay for electric power, whether the electricity is generated on the premises or is obtained from the central station company.

In order to start these small garages, however, it has been customary in some cases to make claims for the electric vehicle which may sound plausible to those who know nothing about the subject but are merely absurd to anyone who is familiar with motors, batteries and electric meters. We read, for instance, that "No skilled labor is necessary to operate an electric vehicle, that in charging all that need be done is to close a switch, and that automatic apparatus will do the rest, that the cost of operating electric vehicles is independent of the mileage, that the bill for electric power will not be over \$7 per month, and so on." Such claims create the impression that it is not necessary for a man to know anything about electricity in order to qualify as manager of an electric garage, and the result is that less intelligence or less common sense is exercised in the operation of electric vehicles than there is in the operation of any other class of apparatus for which the central station supplies power. For proof of this statement a large volume might be written with an account of the different kinds of abuse to which electric vehicles are subjected by users who have been told that a child can operate an electric vehicle.

In more than nine cases out of ten, when the owner of a private garage who makes a complaint about the size of his power bill is asked how much electricity is used each night for charging he will answer by asking "Do you mean what button I start it on"? or some such question, although an electric meter stares him in the face every time that he enters his so-called garage.

*Battery Expert, Commonwealth Edison Company.

The old horse stable as temporary quarters for the electric vehicle has done good service in showing what an electric vehicle is capable of doing under the most unfavorable conditions possible, but we cannot rest satisfied with it as a permanent solution of the garage problem.

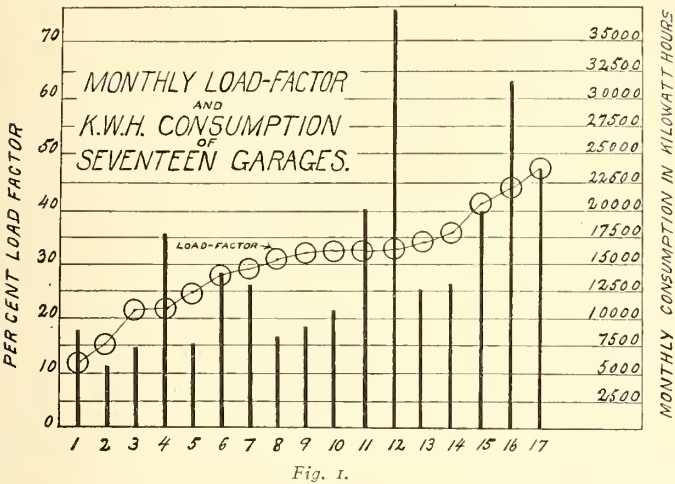


Fig. 1.

lem. Instead of urging the prospective purchaser of an electric vehicle to convert the stable into a garage by installing a hit or miss charging outfit, one of the strongest arguments for the electric vehicle should be that the old rat shelter may be torn down and the ground sown with grass seed. Having reconciled ourselves to the loss of the horse, we should not find it so hard to part with the stable.

With reference to the claim that no skilled labor is needed, one of the largest commercial vehicle users in the west was told when he first started to use electrics that it was not necessary for him to hire new men, that the men who were looking after the horse-drawn vehicles would in a day or two know all that there was to learn about operating electric vehicles. How far this claim was justified may be judged from the fact that during the first winter in which the vehicles were in operation, as many as fifteen broken down vehicles would on some days be towed back to the barn. Towing was in fact so much a part of the regular operation that the question has been asked why it was customary to operate electric vehicles in pairs with a rope between them. A teaming contractor located a short distance from the place in which these vehicles were kept, when asked if he knew how this company was getting along with the electrics, replied that he thought they had discontinued the use of the electrics as he had not seen any of them being towed by for some time. They had not, however, stopped using the electrics; they had discharged the barn boss and had hired a technical man to fill his place. What had up to that time been merely a barn then became a garage, and as a result the company is now entirely satisfied that electric vehicles are better than any other type of vehicles for city traffic.

I will give just one instance to illustrate why garages are needed. Two or three years ago the operator of a 4-ton truck who had thrown out his private charging plant because the bills for electric power were too high and because the night watchman who was looking after the motor generator could not tell that anything was wrong until he saw the apparatus smoking, took the truck to a public garage located 6 miles away. The truck was operated from this garage for over a year, 12 miles, or about one-half the daily mileage being made in going to and from the garage. Instead of discontinuing the use of the electric as he might reasonably be expected to do

under the circumstances, he bought three more electrics. He did not do so, however, until after he had made different arrangements for garaging. Scores of instances might be given of cases where electric vehicles have been discarded, the owners thinking that the vehicles themselves, and not the garaging arrangements, were at fault.

When the public is made to understand that an electric vehicle in order to be successful, must be operated under the supervision of someone who knows what an electric vehicle is, we will no longer see the owner of one of these cars taking it to a livery stable or a gasoline garage under the impression that it will there receive the right kind of attention. From the outside a gasoline garage may look very much like an electric garage, but it would be as reasonable to expect an electric vehicle to be properly cared for in a tannery as in a gasoline garage.

The second factor which makes it difficult for a small garage to perform the functions of a garage properly, namely, the higher cost of electric power in small garages, cannot be left out of consideration when electric vehicles are to be operated in competition with vehicles using other kinds of power.

It is not necessary here to point out the various reasons why the small garage is obliged to sell electric power at a higher rate per kilowatt hour than the large garage. These reasons will readily occur to anyone who gives the subject a little thought. Generating losses, transmission and converting losses and many other factors will always make the cost higher to the small garage whether the electricity is generated on the premises or is obtained from some outside source.

Sometimes we hear it stated that the cost of electricity is so small a part of the total cost of operating an electric vehicle that it need hardly be taken in consideration when advocating the use of electric vehicles.

In some cases this is true, but in the majority of cases it is not. Where the vehicle is used as a toy the cost of electric power is seldom a consideration that will prevent the electric from being used, and sometimes also when used for commercial purposes the cost of power is a relatively small item. For instance, a one-ton truck doing only as much work as could be done with one

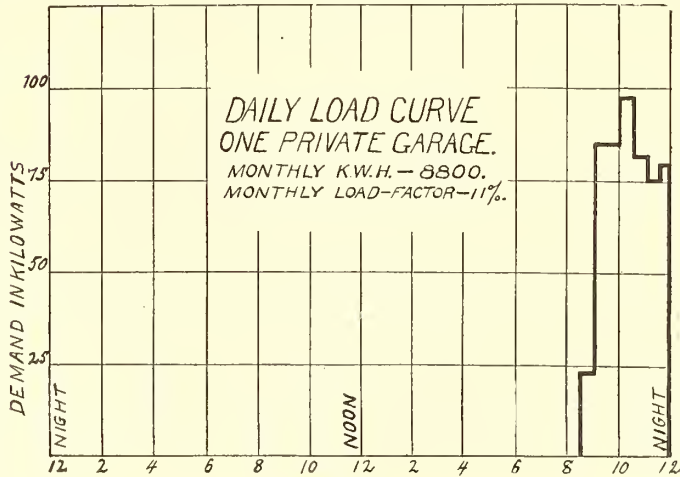


Fig. 2.

horse should not use over 150 kilowatt hours per month, which at 5 cents per kilowatt-hour, would be \$7.50 per month, or only a little more than hoof pads for the horse would amount to. This same vehicle, however, if operated to its full capacity making 50 or 60 miles every

day, might use \$40 worth of electricity, which would be an item in the cost of operation second in importance only to that of the wages paid to the driver.

Five cents per kilowatt-hour is as low a figure as the average garage can now afford to sell electricity for

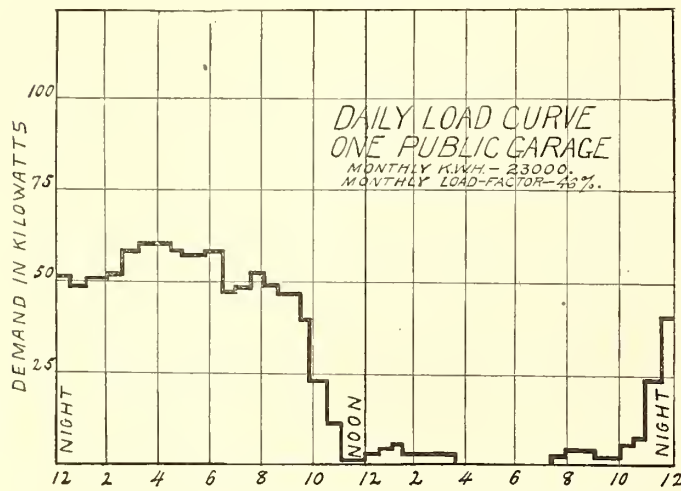


Fig. 3.

and lower than the small garage as a rule can sell it for.

The majority of central stations now make exceptionally low rates for electric power when used in large quantities and with certain restrictions in regard to the manner in which the power is used, but the small garages are not, as a rule, in a position to take advantage of these low rates.

Sometimes also there is an avoidable waste of electricity in small garages for which there would be no excuse in a large garage. Over-charging of batteries is sometimes carried on as if electric power did not cost anything, and frequently batteries are charged from circuits whose voltage is almost high enough to charge twice as many cells, thereby wasting one-half of the energy in resistance coils. While it is true that the cost of electricity is gradually going down in the most of our

operate them from large and properly equipped garages instead of trying to maintain a separate garage for each vehicle.

Fig. 1 shows how power is now used in several of our garages, giving the total consumption and load factor of each, the garages being numbered in the order of their load factor.

Fig. 2 shows the daily load curve of a garage having a load factor of 11 per cent, which is below the average.

Fig. 3 is that of a garage with a load factor of 46 per cent, which is considerably above the average.

From these curves it will be seen that there is ample room for improvement in the operation of our garages in regard to the economical use of electric power, and that under certain garaging conditions it would be impossible for any electric vehicle to make a good showing. How long before we will have better garaging arrangements must depend upon the amount of co-operation that the different interests involved bring to bear on the question.

At the last meeting of the National Electric Light Association, an electric vehicle creed was promulgated and largely subscribed to by the central station men present. This creed is all right as far as it goes, but it should have at least one more article added to it, namely: "We believe that properly equipped public garages are necessary for the development of the electric vehicle industry." Another criticism to which the creed is open, is that no mention is made of the sacrifices that must be made in order to obtain the rewards held out to view. This makes the creed too easy. A public profession of faith is nevertheless encouraging, and the adherents of this creed can be relied upon to act when the path of duty and self interest is clearly discerned. The duty that seems to lie nearest to hand at the present time is that of helping to establish suitable garaging facilities for electric vehicles.

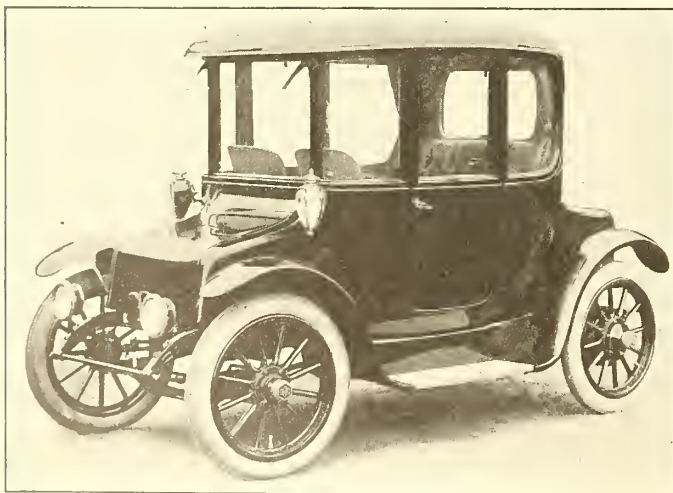
Solid Tire Equipment

In selecting the best tire equipment for a given service the manufacturer has to choose from among several desirable qualities which may be obtained in tires of various types. He can easily obtain a tire which excels in any one of the several desirable qualities of resiliency, resistance to punctures, durability, etc., but such qualities if emphasized are invariably secured at the expense of other equally desirable ones. For instance, the pneumatic tire can be made to give wonderful resiliency and with perfect riding qualities, but it of necessity will be deficient in durability and puncture resisting qualities.

On the other hand, a tire made to resist punctures and to stand the wear of hard use will be deficient in resiliency, and consequently in easy riding qualities, which also effect the speed and mileage of the car, especially an electric.

Made to give maximum resiliency, easy riding and a minimum of resistance to inequalities of the road it will be found to be deficient in wearing qualities. If on the other hand the solid tire is made to give a very great amount of wear it is found to be less satisfactory in its riding qualities.

The ideal tire is one which combines all of the desirable qualities in proper proportion. We do not want to sacrifice wearing qualities to secure extreme resiliency, nor do we want to overdo the matter of durability at too great an expense of the resilient qualities.



Ohio Five Passenger Brougham.

large cities, there is no immediate prospect of its going so low as to make such a waste of power seem justified under any circumstances.

It is evident, therefore, that in order to get the best that is in the electric vehicles out of them, that we must

Louisville Has Model Electric Garage

New Charging Station Presents Interesting Features Making for Efficient Care of Electrics

THE Ohio Electric Car Company, Toledo, in October, 1913, appointed George G. Bader as distributor of Ohio electrics in Louisville, Ky. The agency was soon established in a prominent store room on Fourth street.

This favorable location, together with an advertising campaign, served as an introduction of the car to the local electric car admirers.

Successful marketing of the Ohio electric during the first year enabled Mr. Bader to interest additional capital for the purpose of erecting and equipping a first-class electric garage.

The Electric Garage Company was incorporated with a capital stock of \$25,000. Mr. Bader was elected president, J. P. Ouerbacker, vice-president, F. S. Ouerbacker, secretary, and J. W. Button, treasurer.

A most desirable location was secured and the first garage in this section devoting exclusive attention to the sale, garaging, and repair of electric cars was opened for business in November, 1914, at 1817 S. Third street.

Locating the garage in the heart of a fine residence section and upon the principal street in the city, had additional value in an advertising way, because it compelled the attention of every car owner in the city, and helped very much to keep the Ohio electric before all prospective owners of electrics.

Money was not spared in making the building and equipment the very best possible for the service of electric pleasure cars.

The building was made absolutely fire-proof, lighting and ventilation were planned for the greatest efficiency, and no posts used in the support of the roof, so that cars could be freely and conveniently moved any place about the garage. The roof is one solid piece of reinforced concrete, the walls of brick, while the floor is made of concrete with a raised ledge all along both sides to prevent the accidental touching of a car against the walls.

A model constant potential charging plant, entirely a General Electric Company type, was installed.

Previous to the installation, battery manufacturers had recommended the charging of lead storage batteries at any rate that did not cause heating nor gassing.



There Are No Posts in the Garage Proper.

The Electric Storage Battery Company had successfully worked out a constant potential charging system by connecting enough additional cells in series with the various sets of batteries on charge to produce a uniform voltage throughout.

The General Electric Company's engineers developed the apparatus which resulted in the elimination of the necessity for using the above mentioned cells, so it in-

stalled the first constant potential charging plant that was entirely built by the General Electric Company.

This motor generator set has a normal rating of 292 amperes with an overload capacity up to 350, at which point the circuit breaker releases. There is an effective speed limiting device attached. The voltage range is from 70 to 120 controlled by a Tirrell regulator.

The wiring to and from the distributing panels, of which there were two and now three of six outlets each,



Ohio Electric Garage, Louisville, Ky.

was made especially heavy, in fact heavier than necessary, local inspector rules being overly exacting.

The charging plant was put into operation and thoroughly tested by the General Electric Company's engineers and H. P. Dodge, at that time connected with The Ohio Electric Car Company.

From the beginning of the operation of this charging plant, complete and fairly definite records of all charging done, have been kept. Each car garaged is registered according to the following system: a daily on an individual sheet records the name of the car owner, address, date, make of car, time called for, when delivered, by whom delivered, time at which the car is to be returned to the garage, when received at the garage, by whom returned, and any special requests or conditions of car, out of ordinary, are specially noted on this sheet by the man in charge of the garage at the time the car is returned. It is then ascertained whether or not the car needs any of the following: Wash, polish, oil, adjustment, charge and flush, and whatever is found necessary is checked for the night crew to attend.

If the specific gravity is found to be below 1.230 the car is usually charged, unless the customer is one who does not make long drives. The following records are made: The time at which the car is put on charge, gravity, ampere rate, and temperature. Corresponding records are made when the cars are taken off charge.

In charging 40 cell cars, the voltage of the generator is set at 92 or 2.3 volts per cell. Cars with more than 40 cells are grouped and charged together at correspondingly higher voltage, while cars equipped with less than 40 cells are either grouped and charged

at lower voltage using resistance for the ones, the voltage of which is less than that of the highest voltage of the group. This same method is employed when cars of less than 40 cells are charged at the same time with cars of 40 cells.



Wholesale Grocer Employs Walker Trucks.

Using a 40 cell job as an illustration, the following will be the characteristic of the charge. The battery in a practically discharged condition will take about 120 amperes for just a moment, in five minutes the rate will have fallen to 80 amperes at which point it will remain stationary for a few moments, then gradually fall until at the end of an hour it will have decreased to 40 amperes. The rate continues to decrease more gradually then and automatically tapers to zero at the finish of the charge. If the battery is in good working condition the entire charge will require much less time than was the case with the old methods. If it is found that gassing is almost imperceptible and the temperature seldom changes as



G. M. C. Electric for Central Station Service.

much as 10 degrees, usually about 4, and often as low as 2 degrees.

In charging unknown cars, after the usual readings have been made, the initial part of the charge is given through resistance and wiring of the car is

closely watched for temperature; later when the car has a partial charge and it is found that sufficient current has been absorbed to give the battery an effective counter E. M. F. the resistance is cut out and the battery is allowed to take current without resistance loss.

During the overcharge, the work is done just as bring a healthy battery to 1280 in a comparatively short period of time.

Owing to the tapering characteristics of charging by constant potential, the cars are put on charge gradually, each car being added to the generator load when the load is at least 120 amperes below the point at which the circuit breaker releases. When the generator is practically fully loaded, cars added are put on with resistance, and when the load falls the resistance is cut out.

Monthly inspection sheets are used to give the owner a detailed report of the condition of the car and battery. At this time the owner is advised of any necessary repairs, except those found in daily inspection which are telephoned at once before making repairs. This method has served to increase the owner's interested and intelligent understanding of his car,



Electric Truck with Electric Sign Operated by the Vehicle Batteries.

its operation and what is necessary to the car's successful garaging.

That the following of this plan of service has been satisfactory to owners and buyers of electric cars, and that its adoption has been instrumental in promoting the business success of the company is proven by the fact that it soon outgrew its original plant and has been forced to double the original space.

It has just completed a two-story addition, built at the rear though joined to the original structure erected last fall. The lower floor is being devoted to garage service, while the upper floor has been fitted out as a battery repair and assembling room on one side, while the other side of the floor is for the housing of cars undergoing general overhauling or repairs.

The remarkable success is conclusive evidence that intelligent and careful attention to the electric car business will afford the patrons of such a garage far greater and better service, less worry and less expense, and will reimburse the operators to a remarkable degree through the increased efficiency of garage operation and the increased sale of electric cars.

The time for the electric as a side line for the garage man has passed.

Volkcar Quality Batteries

For Electric Vehicles

- ¶ The Anderson Electric Car Company, manufacturer of Detroit Electrics has been using our batteries in Chicago for five years and are guaranteeing them for 15,000 miles.
- ¶ That's what the largest electric car manufacturer in the world thinks of Volkcar batteries.

Electric Vehicle Batteries renewed and parts furnished for either passenger or commercial electrics

VOLKCAR STORAGE BATTERY CO.
2441-43 Michigan Avenue, Chicago

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would prove both a convenience and a means of real profit. Each issue of *Electric Vehicles* is of interest and practical value to every man in the industry. If you miss one copy, you may miss an article or an idea that would have a vital effect on your work.

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*For Pleasure and Commercial Cars.
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WRITE FOR CATALOGUE

PHILADELPHIA STORAGE BATTERY COMPANY

ONTARIO AND C STREETS
PHILADELPHIA, PA.

DEPOTS AND AGENCIES

NEW YORK BOSTON CHICAGO CLEVELAND
WASHINGTON DENVER ROCHESTER ST. LOUIS DETROIT
BUFFALO SALT LAKE CITY MINNEAPOLIS KANSAS CITY, MO
CINCINNATI TORONTO SEATTLE PORTLAND, ORE.
OAKLAND SAN FRANCISCO LOS ANGELES SACRAMENTO

Horse Flesh Versus Electricity

Merchandise is now delivered by motor trucks to points 30, 40 and 50 miles away from the big city. This increased radius has automatically eliminated the horse.

But the bulk of deliveries are still within the 15 mile city zone. This "bulk"—which is from 70 to 85 percent in volume—is almost wholly within the economic field of the Electric truck. With gasoline trucks for the very long hauls with few stops and the Electric truck for the shorter hauls with many stops we have really no need for the city truck horse except in isolated cases.

Nearly \$75,000,000 worth of fine American horses have gone to Europe within 12 months. Good horses will be higher than ever as a result. Trucking horses however good die by scores of thousands from the heat; others get broken legs on icy pavements; *entire stables are cleaned out by epidemics.* Hay, grain, straw and other supplies keep climbing in price. Why attempt to keep up delivery equipment so inefficient at constantly increasing expense?

We have some valuable figures involving the relative efficiency of horses and G. V. Electrics. We suggest that you ask for them and for our handsome and interesting catalogue.

General Vehicle Company, Inc.
 *Long Island City, N. Y.* 
New York, Chicago, Boston, Philadelphia

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The Ohio Electric



*The
Envied
Electric*



THE OHIO ELECTRIC

is built with but one goal in view—perfection. It is intended solely for those who will have nothing else. Its appeal is not to individuals who can, or must, be satisfied with less.

Perfection is not a matter of dollars-and-cents measurement. As well might Raphael have tried to save a tube of pigment in painting the Madonna; or Michael Angelo a few hours' labor in carving a masterpiece.

Therefore, time or skill or money have not been spared in producing the Ohio Electric. And its price is in fair accordance with the marvelous artistic achievement it embodies.

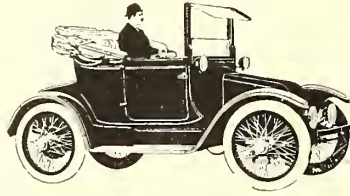
The Ohio Electric is the unquestioned choice of the highest class of electric-car buyers. The intrinsic merit of the car, plus the quality of advertising we are doing, assures to Ohio dealers the cream of the business—and on an exceptionally profitable basis.

THE OHIO ELECTRIC CAR COMPANY, 1551 W. Bancroft St., Toledo, O.



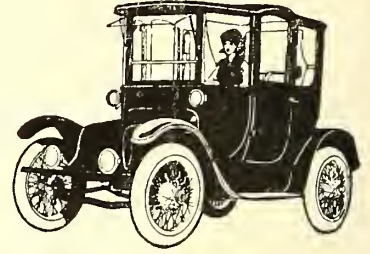
Now \$1715

A year ago \$2600



Now \$1715

A year ago \$2600



Now \$1880

A year ago \$2800

3

Great New Reasons Why You Should Buy a 1916 Chicago Electric

→ **PRICE**

The cost of a Chicago Electric does not now stand in the way of its purchase. We well expect a decided increase in sales because of the remarkable lowering of prices.

→ **UPKEEP**

Batteries are not included in the above prices. You can now rent batteries at a minimum cost per month, covering all battery repairs and upkeep. Those preferring a battery with the car, add \$270 to the prices above.

→ **\$100
PAYMENTS**

The strong financial standing of this Company makes possible our deferred payment plan. A Chicago Electric can now be secured by paying \$500 cash, then \$100 a month until the balance is paid.

THESE lower prices, together with the sustained high quality of the car itself, are our strongest bids for your interest—the most substantial reasons why you should buy this electric, which is setting new standards, making new prices and offering the greatest possibilities to electric car owners.

No radical changes have been made in the 1916 models over those of the past season, but numerous desirable refinements and improvements have been added. For example:

A New Painting Process provides the deepest finish and luster with greater wearing qualities than ever before attained in the art of motor car painting.

A Self-Oiling Steering System adding greatly to the ease of driving—the more extensive use of aluminum throughout the body construction—new designed fenders and many other refinements will be found.

Demonstration Without Obligation

Walker Vehicle Company

Makers of Chicago Electrics and Walker Electric Trucks
FACTORY, 39TH AND WALLACE STS., CHICAGO

CHICAGO SALES
2700 Michigan Avenue
Telephone Calumet 3000

EVANSTON BRANCH
Clark and Benson Avenue
Telephone Evanston 481

ELECTRIC VEHICLES

A MAGAZINE FOR THE ELECTRIC CAR OWNER. \$1.50 PER YEAR. 1253 MONADNOCK BLDG.

Vol. 7

CHICAGO, NOVEMBER, 1915

No. 5



RAUCH AND LANG BROUGHAM

Detroit Electric

Can There Be Any Question *Now* As to Which Electric to Buy?

CERTAINLY NOT in regard to *quality*. For in point of workmanship, design and materials, the Detroit Electric embodies the best that nine years' experience in *specializing* on electric car has developed.

CERTAINLY NOT in regard to *beauty*. The design, body lines and finish of the Detroit Electric have been pronounced *supreme* by the world's acknowledged automobile authorities.

CERTAINLY NOT in regard to *economy*. So simple and efficient is the mechanism of the Detroit Electric, so strongly is it built, so *good* is the quality both in essentials and details, that your operating expense is kept at a minimum.

CERTAINLY NOT in regard to *price*. For doubled production has enabled us to make the lowest prices ever quoted on as high grade electric cars. Further, during its nine years in business, the Anderson Electric Car Company has *never inflated* prices to permit of *fictitious* price reductions in order to close sales.

CERTAINLY NOT in regard to *service*. We know that no better automobile service is offered than that extended to Detroit Electric owners.

CERTAINLY NOT in regard to the *Company* behind the car. For this company is the strongest electric car builder in the business. Last year the Anderson Electric Car Company produced over one-third of the electric cars built and sold. This year the demand for Detroit Electrics has forced double production.

This merited demand by the public has placed the Anderson Electric Car Company in a most envied financial and prosperous position.

Increased Efficiency—Hence 15,000—Mile Battery Guarantee
for Chicago Delivery

Anderson Electric Car Company

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Volume VII

CHICAGO, NOVEMBER, 1915

Number 5

Electric Vehicle Association's Annual Convention

Sixth Meeting Held at Cleveland, October 18 and 19, Proves Great Success

THE sixth convention of the Electric Vehicle Association of America held at Cleveland October 18 and 19 was the most interesting and valuable in the history of the association. Over 300 delegates were in attendance, 90 representing central stations, 45 manufacturers of electric vehicles both commercial and passenger, 52 representing batteries, 65 accessories, 10 electric garage men, 25 representing various electrical magazines, and others interested in the progress of the electric vehicle industry. As the association had previously planned, pleasure was subordinated to business, making the two days' convention primarily a business meeting for busy men.

The convention was formally opened Monday morning with an address of welcome by Bascom Little, president of the Cleveland Chamber of Commerce. President John F. Gilchrist in his address reviewed the activities and accomplishments of the association during the past year, mentioning the fact that the association would publish its own organ during the coming year. The report of Secretary A. Jackson Marshall dwelt on the stimulating work which has been done by the general office, and the reports of the various committees further emphasized the importance of this phase of the work in promoting advertising and sales campaigns.

The afternoon session was devoted to reports of committees and to two papers, one on "Industrial Trucks in the Service of the Pennsylvania Railway Company," by T. V. Buckwalter, and the other on "The Electric Taxicab," by I. S. Scrimger. The electric taxicab has established itself as a commercial success in Detroit, where a large fleet have been in operation long enough to prove conclusively that the electric taxi is the most economical and efficient vehicle for transfer service. One of these luxuriously equipped taxis was exhibited in the streets of Cleveland as a feature of the convention where it caused considerable comment and admiration. In no other type of vehicle is the contrast between the noisy, jerky gasoline machine and the silent, smooth-running, clean electric so evident as it is in this type of cab. As proof of its popularity in Detroit, the owner cited instances where patrons have waited as long as a half hour

BY A. JACKSON MARSHALL

to secure one of the electric taxis rather than use the old type of gasoline machine that stood ready for them.

Mr. Buckwalter's paper dealing with the experience of the Pennsylvania Railroad in electric industrial trucks dwelt on the four distinct classes of these trucks according to their application, namely: the baggage and mail trucks used in passenger stations, warehouse trucks for

freight stations and wharves, shop trucks for general indoor industrial purposes and tractors for propelling freight cars. Some very interesting operating data was presented, indicating a tremendous saving over the older methods of doing the same work.

During the evening session Walter H. Johnson reported on central station cooperation, recommending a closer alliance between central stations and other phases of the electric vehicle industry by the maintenance of an electric vehicle department in every central station, by the use of electric vehicles wherever possible, both trucks and passenger cars, by establishing better charging facilities and by securing greater publicity for the electric vehicle. An address by George H. Kelly on "Problems we are facing and how they may be met," furnished the basis for some interesting discussion. From the views expressed it was evident that there was a feeling prevalent among the manufacturers that



Walter H. Johnson, President Elect.

greater attention should be given to the care of the electric vehicle. While one of the chief advantages of the electric is its extreme simplicity and fewness of working parts, nevertheless in order to maintain the most efficient performance expert care and attention is required. Emphasis was placed on the need for more and better garages. The concluding paper proved one of the most interesting features of the first day's sessions, being the presentation of Charles A. Ward's paper on "The Field for the Small Electric Delivery Vehicle." It was with deep regret that the convention heard of the unfortunate circumstances which prevented Mr. Ward from attending the convention and resolutions were drawn expressing the sympathy of everyone present for Mr. Ward at the death of his father. After the reading of the paper by J. C. Boyers a motion picture followed showing one of the Ward-Edison electric trucks which traveled from

New York to Cleveland, carrying its full capacity of 750 pounds, in nine days, covering a distance of 740 miles on 165 kwh. with a total cost of \$8.25 or a fraction over 1 cent per mile. The following statement made by Thomas A. Edison regarding the Ward-Edison truck, was thrown on the screen:

"The combination of the Ward special delivery wagon, sold on easy payments, and my storage battery, on the new rental plan, starts a new era for the electric vehicle. I believe that nothing can now be produced that will surpass the electric motor for economy, reliability and safety in delivery service."

At the Tuesday morning session the report of the official organ and transactions committee was presented by P. D. Wagoner, followed by the report of the parcel post delivery committee by W. P. Kennedy. "The Comparative Development of the Commercial Power and Electric Vehicle Loads," by Messrs. H. H. Holding and S. G. Thompson, was presented by the latter, showing some interesting original data on the progress of the commercial electric vehicle. A paper entitled "The Comparative Operation of Electric and Gasoline Machines in the Same Service," by Messrs. W. J. Miller and S. G. Thompson, was read by Mr. Miller dealing with tests conducted to compare the speed of acceleration and deceleration of both gas and electric machines, showing the stops per mile and the total time available for running the vehicle.

After the presentation of this paper the association had the very great honor of hearing from E. W. Lloyd, president of the National Electric Light Association, who was a guest at the convention. Mr. Lloyd gave an interesting and constructive address, the theme being a closer co-operation in the electric industries. During the course of the address, he pointed out that the electric vehicle constituted one of the most important branches of the electric industry and that the Electric Vehicle Association of America was certainly to be congratulated upon its extremely practical promotion work which had gained for the electric vehicle wide and valued recognition.

Mr. Lloyd intimated that the National Electric Light Association would esteem it an honor to become more intimately associated with the Electric Vehicle Association even perhaps to the point of amalgamation thereby strengthening what should logically be the representative electrical body, departmentized and operated in a manner to secure the greatest profit and progress to the entire electrical industry. Mr. Lloyd's remarks were effectively substantiated by H. M. Edwards, treasurer of the association, who offered a resolution that the association give careful consideration to the National Electrical Light Association's invitation and the resolution upon being seconded and adopted was passed to the incoming (present) administration who will work out the necessary details leading to consolidation and more extensive promotion of the electric vehicle.

"Electric Vehicles in Municipal Service," by A. J. Slade and R. D. Dumont, was presented by the latter. This paper and the ensuing discussions by Day Baker and S. G. Thompson dealt exhaustively with the various departments of municipal service where the adaptability and economy of the electric recommends it.

The final session Tuesday afternoon was devoted to various committee reports on insurance, operating records, and garage and rates, and to the presentation of two papers. The first paper, "The Function of the Electric Garage," by R. Macrae, pointed out the duties of the electric garage emphasizing not only the proper storage and charging of the car, but the mechanical care of

the various parts and accessories. Establishing more commercial garages would greatly aid electric truck owners and would be an impetus to increased commercial-vehicle growth.

After the discussion following the presentation of this paper, the report of the nominating committee was given, and the officers for the ensuing year were elected: President, Walter H. Johnson, vice-president of the Philadelphia Electric Company; vice-president, E. S. Mansfield, superintendent of the operating bureau of accounts of Edison Electric Illuminating Company of Boston; treasurer, H. M. Edwards, auditor of the N. Y. Edison Company; secretary, A. Jackson Marshall. The members of the board of directors whose term expired were re-elected and John F. Gilchrist was elected to fill the position made vacant by the election of E. S. Mansfield to the vice-presidency.

The last paper was presented by Willis M. Thayer, entitled "Data on the Hartford Electric Light Company's Experience with the Battery Exchange System for Commercial Vehicles." This paper was followed by an explanation of the plan adopted by the Walker Vehicle Company for the rental of batteries. This paper read by Gail Reed showed the feasibility of the battery rental system when applied to passenger vehicles. A Chicago cabriolet roadster completed the 424-mile trip from Chicago to the Cleveland convention in an actual running time of 28.25 hours, including a 15-mile detour. On the third day of the trip the car made 142 miles.

Tuesday evening a banquet was held at the Hotel Statler, the attendance being 140. The speakers for the evening were Messrs. John F. Gilchrist, Samuel Scovil, W. W. Freeman, E. W. Lloyd, and George H. Kelly.

An extremely interesting feature of the convention was the numerous electrical exhibits on the convention floor. The following companies displayed their products: American Taximeter Company, Baker R. & L. Company, Cutler-Hammer Mfg. Company, Electric Products Company, Elwell-Parker Electric Company, General Electric Company, Gould Storage Battery Company, Hertner Electric & Mfg. Company, Leonard-Bundy Electric Company, Lincoln Electric Company, National Carbon Company, National Electric Lamp Works, Ohio Electric Car Company, Philadelphia Storage Battery Company, U. S. Light and Heating Company, Willard Storage Battery Company. The following publications were at hand for distribution: *ELECTRIC VEHICLES*, *Automobile Topics*, *Central Station*, *Commercial Car Journal*, *Electrical World*, *Electrical Merchandise*.

The entertainment provided for the ladies who attended the convention offered many pleasant opportunities for seeing the city. Monday afternoon was devoted to seeing Cleveland in an electric, visiting its stores, shops and points of interest, and for the evening a theatre party was provided. Tuesday a luncheon at the country club, and drives about Cleveland's beautiful parks afforded a pleasant diversion, and in the evening the ladies were guests at the banquet.

That the convention was a great success was evidenced by the large numbers that crowded into the convention hall at every session, in fact the attendance was surprisingly large to the very end of the convention. It is indeed rare that so much of real value is accomplished at a convention, and the association feels that the splendid showing of general co-operation between the various branches of the industry is a very encouraging omen for an unusually prosperous year.

Chicago's Latest Exclusively Electric Garage

The Last Word in Construction, Equipment, New Facilities for Successful Care of Automobiles

CHICAGO is indeed the city of electrics. The latest estimate shows a total of 3,200 passenger electrics. In order to house and care for this mass of vehicles the city is equipped with 72 garages. And many rank among the greatest exclusive electric garages in the world. Each year shows greater development in the garage branch of this industry. Larger and better structures, more improved apparatus and more satisfactory service in general has assisted ably in promoting the successful operation of the electric car.

The latest and probably the greatest establishment to house electrics, both passenger and commercial types, has been constructed at an expense of nearly \$90,000 and has a capacity of 90 vehicles.

This station, known as the Elite Exclusively Electric Garage, is located at 5601 Harper avenue, in the heart of one of Chicago's exclusive residential districts.

As an exclusive electric garage, it represents the last word in architecture, floor space, lighting, heating, charging facilities, service and conveniences.

The station itself is fireproof and has a floor space of 15,750 square feet. Constructed of fire brick over a steel frame, the building is one story in height with a balcony and basement.

Every possible effort was made by the architects to design a station which would secure a maximum capacity free from any possibility of congestion. In this they have succeeded admirably. The floor space is without interruption. The vehicles stand in stalls 14 feet long and 8 feet wide. The ample width makes collision impossible. Two tiers of stalls are located along each wall. Each is separated by a gutter. The tier closest to the wall is six inches higher, the edge of which affords a bumper to vehicles in the inner tier. This permits two

BY FRED B. SCHAFER

rows of stalls on each side and allows ample room down the middle of the station. Each stall has a number and is reserved for the same vehicle continuously.

The floor is of cement and slopes from the middle allowing surface water to drain down the gutters on either side.

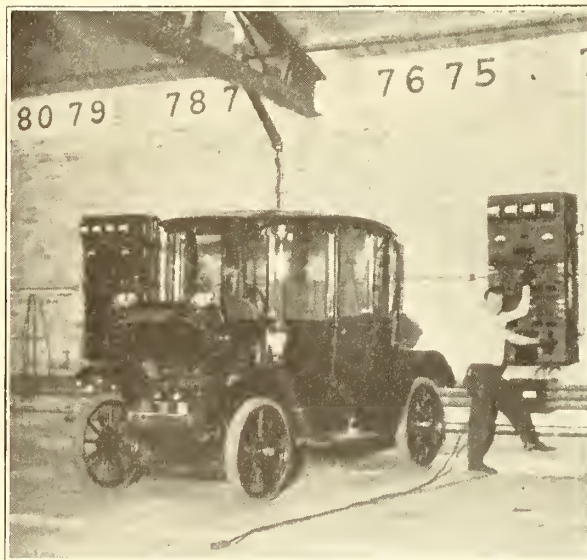
The roof is fireproof and contains six large double skylights which with many wall windows furnish ample sunlight for all purposes during the day time. The artificial lighting is secured by means of fifteen nitrogen 200 watt General Electric bulbs arranged systematically along the ceiling.

Overhead heating apparatus produces efficient results and eliminates any possibility of injuring the vehicles, as in some garages where heating pipes are located along the walls. The heating apparatus was designed specially for this garage.

One of the most interesting features is the arrangement of switchboards for charging. Cutler-Hammer boards are used exclusively. In the station there are 15 boards each

having 60 ampere circuits and an individual meter for each circuit, in order to accurately compute measured service. One large board is kept in reserve, capable of charging trucks and having 150 ampere circuits.

Unlike many other stations this station manufactures the current used for charging. Two 50 h. p., two 25 h. p., one 10 h. p. and one 6 h. p. oil engines built by the International Harvester Company, run single, duplicate or all at once operating four dynamos all on one or various voltages which makes it possible to charge one or as many cars as necessary. The accompanying illustration shows the engine room, adjacent to which a large boiler room, reserve hot water tanks, lockers, rest rooms, shower baths, coal bins, etc., are conveniently located.



Cutler-Hammer Boards Are Used with a Meter for Each Vehicle.



The Elite Electric Garage, in a Chicago Residence District.



Interior View Showing Excellent Arrangement and Ample Floor Space.

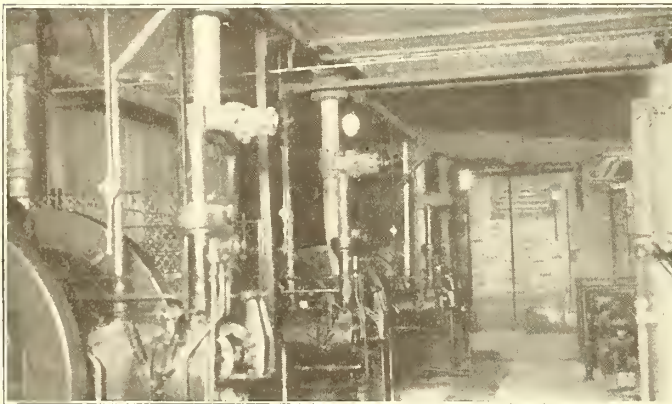
At the extreme front of the building and on a balcony, the general offices and private lockers of car owners are located. Here are the offices of the manager, bookkeepers and stenographer. The locker room for car owners contains all conveniences and provides fireproof and theft protection for all articles to be preserved.

The station has every possible convenience. Intercommunicating telephones keep all departments open to communication. A motor driven door which can be opened or closed from various locations on the main floor and which opens automatically by the wheels of an approaching vehicle is a time and labor saving device.

Two adjustable wash racks equipped with a Powers automatic device to control the temperature of the water, prevent washers from injuring or causing the varnish to lose its finish.

Eight Pyrene extinguishers, vacuum cleaners, lubricating oil pumps and sanitary drinking fountains furnish other conveniences making for maximum service.

To boarders of vehicles the station offers many



Interior View of Engine Room.

opportunities. Uniformed hikers deliver and call for vehicles. Special drivers can be had either for day or night duty.

The management is under the direct supervision of Francis Ingalls who is an enthusiastic believer in the measured service plan as shown in the following:

Storage	\$10.00
General care of car per day.....	.40
Delivering or fetching car per trip.....	.15
For each time over 60 a charge of.....	.20
Electricity; first 100 k. w. h.....	.06
Second 100 k. w. h.....	.05
All excess over 200 k. w. h.....	.04
Discount 2½ per cent cash 6 days.	
Driving—owner assuming all responsibility, per hour.....	.50

TRANSIENTS

Washing, polishing and ordinary cleaning.....	\$ 0.85
Vacuum cleaning of upholstery.....	.25
Delivering or fetching car.....	.25
Charging—Electricity per k. w. h.....	.08

This price is for direct current, which is 25 to 30 per cent more efficient than the a. c., which is used when charging at home, and is correspondingly cheaper.

This is indeed a station which the industry should be proud of. It represents the type of progressive garages which assist in promoting successful electric car operation.

Electric Roadster Built on Gasoline-Car Chassis

The Cambridge (Mass.) Electric Light Company has just put into service a new electric vehicle which in many respects is unique. The car was built in the company's garage, and in its construction a Peerless steering

and running gear and chassis with a 124-in. wheelbase was used. The diameter of the original wheels was cut down to 34 in., the standard size of the company's other cars. This change was the only one made in adapting the gasoline-car chassis to electric operation.

The motor is slung under the car about midway between the rear and forward axles. The method of suspension is by split-iron clamps around the motor frame, so arranged as to permit the coupling of the armature shaft directly to the universal joint of the original transmission shaft, which in turn drives the bevel gears of the rear axle. These gears have a ratio of 3 1/6 to 1. The total weight of the car complete with battery is 5000 lb., which is about 700 lb. more than it was at first designed to be. The greater part of this extra weight was added in order to give proper lines to the body.

The source of electrical energy is a forty-cell "Iron-clad" battery arranged in groups of four four-cell and two two-cell trays in each of the forward and rear compartments. The method of connecting the trays employs simple line couplings with four set screws, and was selected so that all connections should be above the battery in full view of the battery man while charging, and readily accessible from the front or rear of the car without his having to reach over the mud guards. The cells are fifteen-plate units with a normal charging rate of 40 amp. and 16 amp. and a discharge rate of 49 amp., with a rating of 220 amp.-hr. A Sangamo ampere-hour meter records the performance of the battery. The motor has a rating of 80 volts and 60 amp., runs at 1100 r.p.m. and weighs 380 lb. Speeds of 30 m.p.h. on the level and 21 m.p.h. up hills are ordinary every-day running records, and when this electric vehicle is caught in a line of gasoline cars it is able to hold its place without any break in the line.

This rear hood, besides being the battery compartment, also contains a second seat. This second or rear seat is of the invisible type when closed; that is, there are no door handles or latches that show, and it is impossible to open this seat except by means of a secret device known to the operator of the car. Under this seat are kept with perfect safety the tool boxes and any robes or wearing apparel. If the vehicle is left on the street unattended, no one without knowledge of the secret method of opening this rear seat can take from the car any robes or tools.

"Bumps" Police Officer—Gets Compliment

President Wilson was once stopped and reprimanded because his chauffeur disregarded a traffic officer's signals. Evidently President Wilson wasn't riding in the right kind of a car, for Dana H. Howard, superintendent of advertising, Commonwealth Edison Co., during a recent rain and fog period, was driving down the boulevard when a giant traffic officer put up "five huge fingers" for Mr. Howard to stop. But D. H. was thinking about a new campaign. The silent Chicago electric moved on noiselessly and rapidly. The officer threw up both hands, did a little circus acrobatic act, mused up Safety Island and himself in general, and yelled, "What's matter? Can't you see me from that 'famous' car? I know you. You are the chap who has his picture in all the street cars, demonstrating the 'famous' Chicago electric."

If D. H. had not only knocked him down, but also backed up on him and then run over him again, he might have made a sale for a new Chicago electric "limo."

President's Address

Presented at the Sixth Annual Convention of the E. V. A., October 18 and 19

DURING the year just passed, your association has continued its work of aiding co-operation between the various branches of the electric vehicle transportation industry. Standing committees have been at work along the same lines, practically, as those which were studied by the committees of former years. What the committees have done is indicated by the list of very fine reports to be presented at this meeting.

It may be said that the work of the association this year has been consistent and persistent, rather than spectacular. The offices and organization established in the Engineering Building in New York City during the previous administration have been maintained. A great deal of attention has been paid to the accumulation of data and information useful to the members of the association and equal attention has been paid to publicity of value to the industry in the shape of articles prepared for the information of the general public. Much publicity of this latter sort has been secured. The membership of the association has shown a very good growth during the year, notwithstanding the period of marking time which has caused many organizations and industries to stand still. Details of this growth are shown in the report of your secretary.

PROPOSED ADVERTISING FUND.

Early in the year the council gave consideration to a campaign of advertising in national advertising mediums, similar to the one conducted last year. At that time, on account of the retrenchment which was visible on every hand, it was considered inadvisable to undertake the raising of a fund for such a purpose. Later in the year a group consisting of manufacturers of passenger cars and trucks proposed to the association the raising of an advertising fund, this group to contribute an amount equal to any amount which the association members might contribute up to \$50,000. Thus, in the event that the limiting figure was reached, the total fund would amount to \$100,000.

Some work was done in the effort to raise the association's part of the proposed fund. The result was that subscriptions were obtained from electric central station-companies and from manufacturers of storage batteries, amounting to \$29,500. As yet, however, it has not been decided to go ahead with the undertaking.

ASSOCIATION TO PUBLISH ITS OWN BULLETIN.

The council has also taken up the matter of the association publishing a bulletin of its own. In view of the rather general feeling that a publication containing nothing but matter pertaining to the association and to the work in which the association is engaged would have some advantages, it has been decided gradually to wind up the relationship with *The Central Station* which, up to the present time, has contained the official reports of the proceedings of the association. In place of this relationship it is proposed that the association shall issue its own bulletin.

It is quite proper to state that the relations of this association with *The Central Station* and its publisher have always been most cordial and satisfactory. I desire at this time to express the thanks of the association to H. C. Cushing, Jr., for the very able and hearty sup-

BY JOHN F. GILCHRIST

port which he and his publication have given the work in this industry.

The association's finances have been a source of some concern on the part of the council. As was very clearly set forth in the report of Past-President Smith, submitted at the Philadelphia convention of last year, expenditures amounting to \$15,000 per annum seemed necessary to carry on the association's work properly. It should be borne in mind that, in addition to the maintenance of the office and organization in New York, it was necessary to allow to each one of the sections whose dues supported the parent association a reasonable amount of money to carry on its activities. In the opinion of the officers it was only by the exercise of thrift that the association has been able to accomplish so much as it has with the amount named. However, the embarrassing feature was that the revenue from all sources amounted to but little more than \$7,500.

Last year (that is, the fiscal year of 1913-1914) was the first year that a central organization was actually maintained.

During that year, with the consent of subscribers to the advertising fund, enough money was withheld to make up the deficit. But during the year just closed (that is, the fiscal year of 1914-1915) there has been no such fund to fall back upon. The shortage has been made up through the generosity of some of the members who responded to the association's request for such support, so it is hoped that we will go through our convention and turn the year with a small balance in our treasury.

This sort of an arrangement, however, could not be regarded as permanently satisfactory. Therefore, after very careful consideration, your council submitted a revised schedule of dues at a special meeting of the association held in September. At that meeting the revised schedule was approved and adopted, the schedule to become effective on October 1 of this year. Working under this schedule, with what may be expected in the way of growth, the association should be in good shape financially.

CO-OPERATION.

Permit me to say a word about co-operation. If we are really in earnest in the intention to put the electric vehicle, passenger and commercial, where it belongs, we must forget petty differences and act strongly in unison. And that means all of us—manufacturers, agents, dealers, garage keepers, central station men—all who are interested in the electric vehicle industry.

An interesting example of co-operation has been witnessed in Chicago, where, by the working together of all the interests in harmony, the practical operation of a passenger car parking system has been evolved. A lady coming down town may stop at the Michigan boulevard Electric Shop, we will say. She steps in and tells an attendant when she will return for her car. The clerk takes the key and sees that a chauffeur takes the car to the parking space in Grant Park and returns it at the time desired. There is no charge to the lady for this service. The necessary expense is borne by the manufacturers, dealers and garage men.

NATIONAL HIGHWAYS.

While we may not all consider the electric passenger

car a touring car at the present time, nevertheless, we should all, I think, take an intelligent interest in the great national highways, including the Lincoln Highway, extending across the country from East to West and the proposed Dixie Highway extending from Chicago to Florida. The signs of the times point to a great improvement in the character of roads and highways in the United States. One distinguished American statesman has even gone so far as to say that improved highways constitute our greatest asset of defense, and he has drawn a stirring picture of millions of our citizens springing to the defense of their country along the great national highways of the future. However that may be, it is well for all electric vehicle men to keep in touch with the national highway movement. Do not forget that the use of these highways may be found very important for commercial electric vehicles. I know of a recent instance where it was desired to send an electric advertising display wagon from Chicago to Indianapolis, and the people who undertook the task had to abandon the plan in transit on account of the roads encountered.

RENTAL OR BATTERY EXCHANGE SYSTEM.

The year has witnessed a considerable development in the various plans for selling electric vehicles without batteries, giving battery service on some rental or battery exchange plan. It is perhaps too early to express an opinion as to the ultimate result of this movement. It is certainly most interesting and important, and I do not hesitate to say that some plan of this sort must be worked out to a successful conclusion before the electric delivery wagon or electric truck is to be regarded as an entire success for the use of the small merchant. The large user has great success with the electric wagon or truck at the present time, but it seems to me that we must certainly extend a helping hand to the small user in the matter of battery maintenance.

The character of the work which has been done through the year by committees and by individuals is indicated by the details of reports and papers which appear upon our program. I have had the pleasure of going over some of these contributions in advance, and I am sure that you will find them most interesting and instructive. They should bring out a discussion which will be of benefit to all of us.

We have emerged from a quiet year with a faith stronger than ever in the efficiency and practicability of the application of electrically propelled vehicles. I think I may say that those of us who have watched the development of the applications of electricity for such purposes as lighting, motor drive, elevator service and high temperature furnaces, and have in each case witnessed the triumph of the electrical method—sometimes faster and sometimes slower—I think I may say that we who have taken note of this progress do not entertain the slightest doubt that electric vehicle transportation will gradually occupy a broader and broader field until it has become the dominant method.

I wish to take this opportunity to thank the members of the council and the chairman and members of the committees for the loyal support which they have given to this administration. Also, I thank and compliment our worthy and able secretary and his staff on the execution of the association's work.

Those closely in touch with the industry are watching the new battery rental system very closely. If it is developed successfully it will mean a new era in the electric car industry. Although all manufacturers are not selling vehicles on this plan it is expected that with the assistance of the association it will be adopted universally.

New Detroit Sales Offices for Washington, D. C.

Work has been commenced on a new and thoroughly modern fire-proof building, to contain salesrooms, offices, waiting rooms, service station, and garage, for Emerson & Orme, automobile dealers, distributors of the Detroit Electric, on the south side of M street between 16th and 17th streets northwest, Washington, D. C.

Plans for the structure were prepared by Appleton P. Clark, Jr., architect, and the building contract let to the Arthur M. Poynton Co. The cost of the site and building when completed will be around one hundred and twenty thousand dollars, and it will be the best arranged and handsomest quarters for the sale and care of automobiles to be found anywhere in this country without any exception.

The building has a frontage of 135 feet on M street and a depth of 134 feet, and the front will be of tapestry brick of light color and the ground floor front of plate glass, with marquise over both the sales and garage entrances.

On the first floor will be a room with a front of 54 feet and a depth of 44 feet for the display of new cars and accessories.

This room is entered from a hall 8 feet wide, which is entered from the street. On the opposite side of the hall entered from the street. On the opposite side of the hall is located the sales and private offices, bookkeepers' and stenographers' office, ladies' waiting room, coat room, and closets for office supplies, stationery, catalogues, &c.

All the above is handsomely finished with mosaic tile floors, with marble wainscoting four feet high on the side walls, and mahogany doors and window trimmings. The upper part of the walls in the hall will be plate glass. Ceilings will be beamed and with indirect electric-lighting system.

West of the display room for new cars will be located a salesroom 20 by 40 feet for used cars, and adjoining this room on the west is the garage office, in the rear of which is a package room, and back of this is a room for waiting chauffeurs, and west of the garage office, on the extreme west side of the building, is the entrance and exit for cars entering and leaving the garage.

There is a garage space on the ground floor in the rear of the display rooms and offices of 90x135 feet, with facilities for washing and cleaning several cars at one time.

The second floor is a room the full size of the building, and is reached by an Otis electric elevator of four tons capacity, which is located in the rear directly opposite the entrance to the building. This floor has ample washing and cleaning facilities, and will be used exclusively for washing, cleaning, inspecting, and charging electric cars.

The building is of very heavy construction, amply heavy to allow another story to be put on when necessary, and is constructed so that very few posts or columns are necessary, and has stationary curbing around all the columns at the bottoms and around the walls inside, so that it will be impossible to run a car against the walls or columns. A great number of large windows in front and rear gives ample light and ventilation, the ceilings being 17 feet high on both floors.

The heating system will be low-pressure steam, the boiler being located in the basement of the building.

The equipment for the entire plant will be the best and most modern, and will include everything necessary to give the best possible service.

It is expected that the building will be ready for occupancy about January 1, 1916.

Comparative Development of the Vehicle Loads

Presented at the Sixth Annual Convention of the Electric Vehicle Association.

THE prevailing impression that the progress of the commercial vehicle propaganda is slow is justified only as it relates to those cities where endeavor in this direction has been discouraged or where no attempt to introduce these machines has been made at all; for, as a matter of fact, wherever any systematic endeavor to promote the use of electric vehicles has been made, not only has progress resulted, but that progress has been relatively as rapid as have similar gains in other fields of electricity merchandising.

To prove this statement we have selected for comparison the records of three years' development of the commercial-power and electric vehicle loads in Public Service territory in New Jersey, during which period similar systematic exploitation of these two fields of electricity selling was employed. These three years are selected because they represent a period in which business conditions were nearly normal and free from the industrial disturbances which have occurred since 1913.

From these records Chart A and Chart B have been plotted, in which the kilowatt-hour consumption for the years 1911, 1912 and 1913 for both power and electric vehicles are comparatively shown.

In considering these charts, due allowance for the different scales used must be made, otherwise they will be misleading, as the areas shown are not comparable at all

BY H. H. HOLDING AND S. G. THOMPSON

in the relation of vehicle to power load, but only in

their relation to one another in the same chart. In fact, the purpose of the charts is to show the increase in kilowatt-hour consumption in each field and to compare this growth in substantiation in each field and to compare this growth in substantiation of the statement that the electric vehicle load has developed as rapidly as has the power load in the same period. Therefore a proper use of the charts would be a comparison of the power load consumption for 1911 and 1913 and of the electric vehicle load for the same period, which will indicate that the relative increase in business in the two fields has been in the neighborhood of 100 per cent for the power load and 200 per cent for the vehicle load. This more rapid development of the electric vehicle load is probably due to its relative size as compared with the total power load, and therefore the percentage relations are not parallel; still it is noticeable that the curve of increase follows the same general line, as indicated by the upper portion of the plotting.

During the three years covered by the charts a relative amount of effort was expended in each field of electricity selling, that is, the effort was made commensurate with the gross amount of business already developed and the probable increase in each field.

From another angle of comparison, Chart C shows

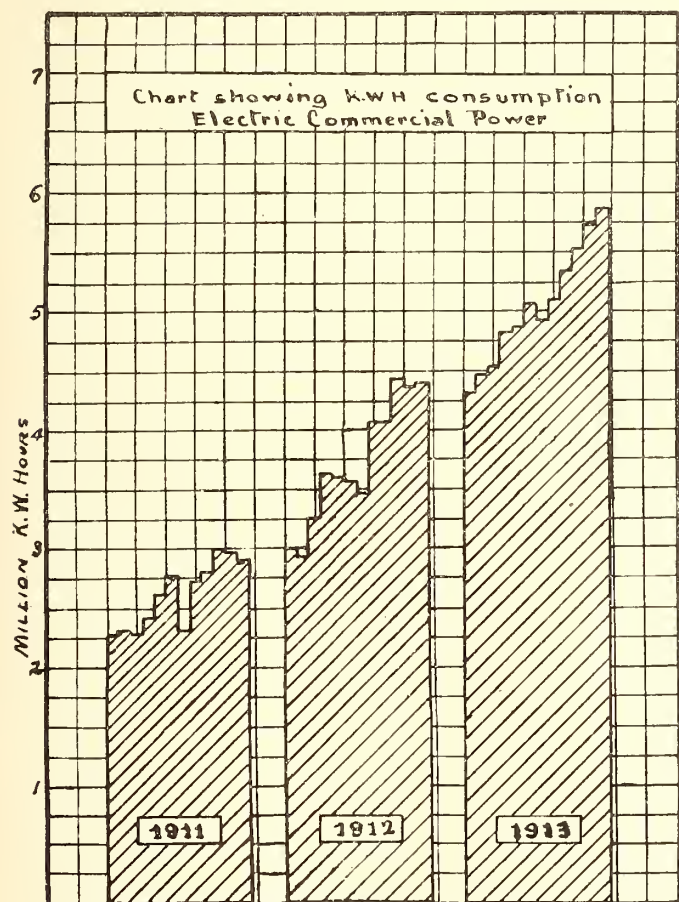


Chart A.

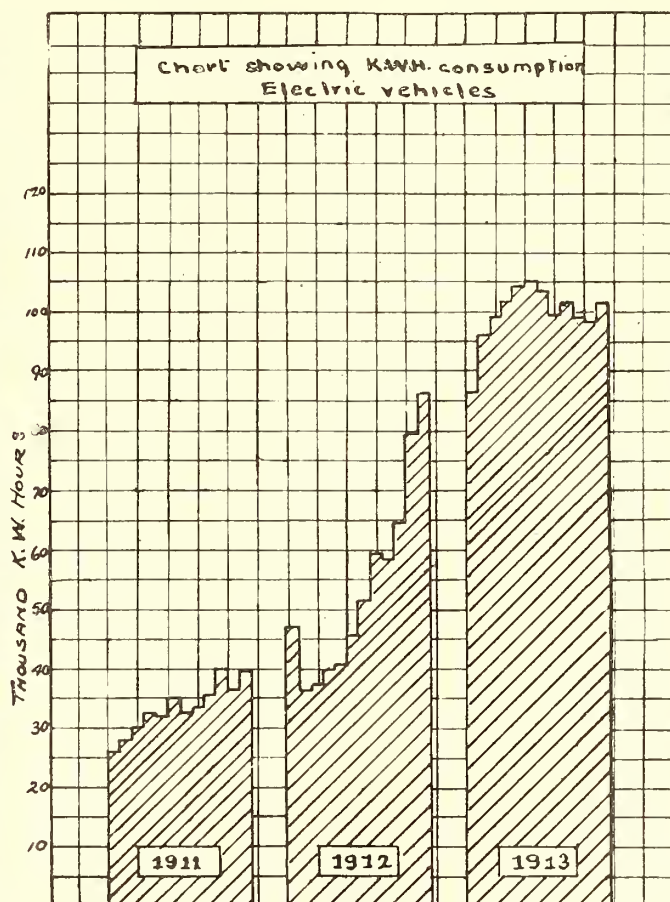


Chart B.

the increase in horse-power connected to the power lines and the number of electric vehicles added during 1914 and 1915, a period of very severe industrial disturbance. Here again it is seen that the curves of increase parallel, again substantiating our first statement that wherever any systematic endeavor to develop the electric vehicle field has been made, progress has been as rapid as in other departments of electricity merchandising.

With these and similar evidence from other localities, it is rather surprising that adverse attitude toward the electric machine should be found so generally existing in the ranks of those most interested in the ultimate gain of the goal indicated by the slogan of the central station interests, "Do it electrically." The fact that this attitude actually exists at all is probably due to error in the selection of the reference point when comparing the electric vehicle development with that in other lines. All values in life are relative, whether there is rest or motion, depending upon the location of the reference point, the proper selection of which will place the electric vehicle in an entirely different light and indicate that it presents a potential field for the sale of electricity comparable with the present commercial power field.

Heretofore the reference point which seems to have been universally used in determining the progress of the use of the commercial car electrically driven, is the commercial car gasoline driven. This conception we believe to be entirely wrong. Suppose we make some comparison with the history of the electric motor in another field.

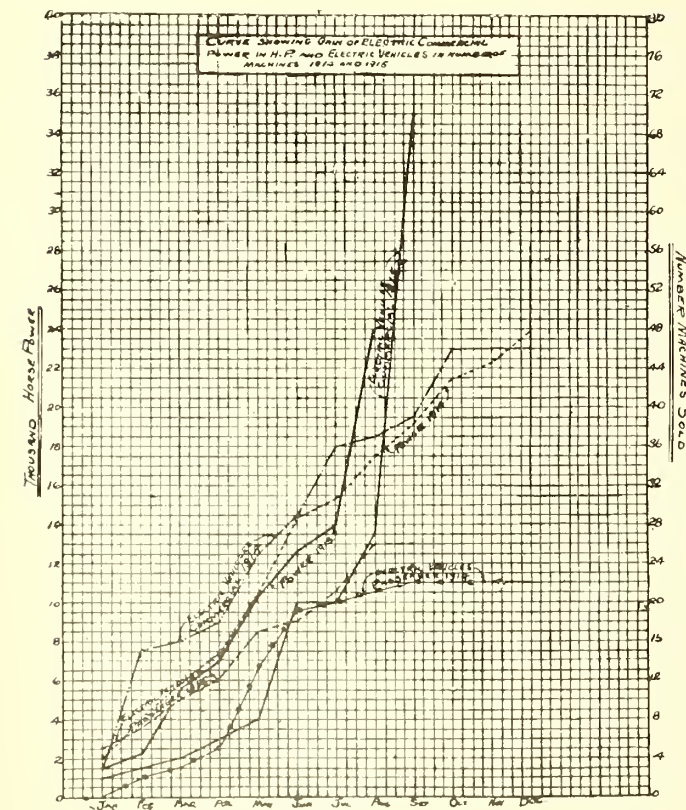


Chart C.

That the electric motor in the factory is displacing other forms of power transmission, no one can deny. Let us see what has been the rate of progress of electric power transmission in the factory. Turning to the United States Census reports we discover that in the ten years from

1899 to 1909 the manufacturing industries of the country increased their product 83 per cent in value. To produce this added output over eight million horse-power was added to the power used in the factories. Of this amount two million horse-power was in electric motors,

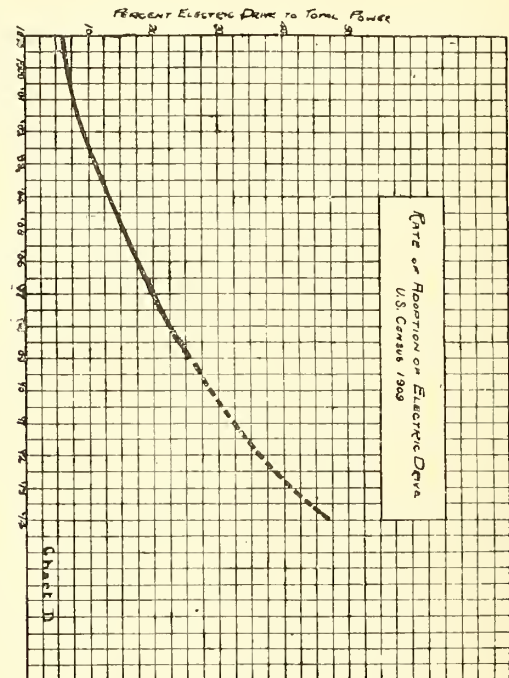


Chart D.

the remaining six million being in other forms of transmission, mostly steam engines with belt drive.

During that entire decade the electric motor was a demonstrated commercial success, yet by no means was it able to monopolize the market for power transmission in the factory.

The accompanying curve (Chart D) indicates the rate of adoption of the electric motor in the industries of the United States, the percentage referring to the total power used.

It will be noted that in five years from 1899 to 1904 the increase in electric drive was but 7.1 per cent, while in the five years from 1909 to 1914 the increase was 21 per cent.

If we use the history of the popularity of the electric motor in the factory for reference, the rate of adoption of the same motive power for the transportation of the product of the factory is in comparison highly complimentary to the latter, because the electric motor vehicle is now where the electric drive in the factory was in 1899.

The change of conditions in this country has created a large demand for vehicular transportation of merchandise, and the demand has been partially met by the use of the *most accessible* substitute for the horse, namely, the gasoline vehicle. That such a vehicle is the "best" does not follow as a conclusion more logically than did the use of steam with belt transmission indicate the superiority of such transmission in the decade referred to above.

As the central station has been an accelerating factor in the promotion of the use of the motor for industrial power transmission, so even in a greater degree its influence through its sales organization will prove to be a mighty power in bringing into "its own" the electric commercial vehicle.

The Electric Taxicab

Presented at the Sixth Annual Convention of the Electric Vehicle Association

ELECTRIC taxicabs were first considered by the Detroit Taxicab & Transfer Company about two years ago, although, personally, I had considered the matter two years prior to the time my company took the proposition up.

The reason for installing electric taxicabs in Detroit is perhaps best described from a letter received from R. B. Jansen, general manager of the Seattle Taxicab & Transfer Company, under date of June 15, 1915, which is as follows:

"If it is not asking too much, would you give me a little outline of your experience with electric taxicabs? From magazine articles and reports of the transfermen's meeting in Detroit, we understand that you have put in electric taxicabs and have operated them for a sufficient length of time to get some idea as to the cost per mile. Could you give me approximately the operating cost per mile, that is, tires, current, and maintenance; the approximate weight; the number of passengers carried; the style of body, limousine or landaulet; wheel base? Is it correct that you assembled these cars yourselves, and what would your opinion be of the possibility of using them in a city where we have a 4 per cent grade on our main business streets and from 7 to 17 per cent grades on the streets just off of the business streets and throughout our residence section.

We do not see any good excuse for continuing the taxicab business unless we can find something different from what we have had in the past. You possibly remember the writer having called on you during his trip East a few years ago," etc.

The last paragraph of Mr. Jansen's letter will explain my reason for installing electric taxicabs in the city of Detroit. I think everyone in the taxicab business will bear me out when I say that the life of a well made gasoline car in a hard service, such as the taxicab business is, could not be much over five years at the outside. My judgment is that a gasoline car to perform satisfactorily will cost \$2,000 to \$2,500. Using the five-year period as the maximum as the life of the gas car, it means that a taxicab company is replacing its equipment for practically new equipment every five years.

In Detroit, we get 70 cents for our first mile and 40

BY I. S. SCRIMGER*

cents for each additional mile; single tariff meters being used. In other words, it doesn't make any difference as to the number of passengers carried, whether one or four—the capacity of the cab—the rate is the same. Comparative figures between the Detroit Taxicab & Transfer Company and other companies in the United States show that the cost of operation per mile is between 30 and 35 cents. Taking

the 30 cents per mile cost as the basis for figuring, if a cab covers 2 miles we receive \$1.10. If the cab returns empty, we have covered a distance of 4 miles for which we have received \$1.10. The cost per mile being 30 cents shows that we have lost on this run, and the history of the taxicab business throughout the United States is that from 40 to 50 per cent of our distances covered are empty mileage. The revenue obtained from service rendered in Detroit is about 33 cents a mile. You will, therefore, see that very little profit is to be made with an expense of between 30 and 35

cents a mile and an income of 33 cents a mile. It, therefore, became necessary that we obtain equipment that could be operated more cheaply than gasoline cabs.

About two years ago, we decided to build one electric cab as an experiment, and the president of this company and myself consulted with the manufacturers of electric vehicles in Detroit, but they were all too busy to give us much thought, and claimed they could do nothing for us unless we were willing to accept the chassis for the pleasure car they were building. The taxicab business being a commercial business, we could not see how a pleasure electric car could be made to serve our purpose. We, therefore, were compelled to build our first car. This we did under the supervision of our engineer, W. J. Behn. Our first car was placed in service at the Hotel Pontchartrain at 2 o'clock in the afternoon, June 25, 1914, and up to the present time has been in continuous service about a year and three months. No advertising was done, nor an announcement of any kind made when this cab went into service. We thought it best to start the electric service, and allow the public to judge whether or not the electric cab would meet all requirements. It was only a short time when we commenced to receive letters of approval, and the cab met with such a signal success that we decided to build eleven more. These additional eleven electric cabs went into service last December and Janu-



Absolutely the Last Word in Electric Taxicab Design and Construction. Exhibited in Cleveland during the annual convention. The Electric Taxicab Shown is One of a Fleet Used in Detroit by the Detroit Electric Taxicab and Transfer Company, and Will Later be Seen in the Principal Cities in This Country and Abroad.

*General Manager, Detroit Taxicab Company.

ary, and have, therefore, been in service about eight months. We are just completing fifteen additional electric cabs, which will be completed between now and the 15th of October, and we have twenty more under way, which will be in service about January 1. This will give us an equipment of forty-seven electric cabs.

The public in Detroit has taken very kindly to our electric equipment; so much so, that we have had people wait from a half hour to three-quarters of an hour for the return of an electric cab, when we had gas cabs standing, which they might have used. We found, when trying to get an expression from the public before installing our electric cabs, that the public were not very favorably disposed toward the electric service. The most of the persons consulted seemed to have only a very meager idea as to how well an electric cab could be made to perform. I heard one gentleman say that he thought electric cars were designed and built for old ladies, and had he known our car was an electric before getting into it, would have declined to use the electric service. This same gentleman said we had not only converted him to the electric, but he was going to buy one for his wife if he could obtain a car that would give as satisfactory results as the one we were building.

It seems to me that the manufacturers of electric vehicles have not kept pace with the manufacturers of gasoline vehicles. I mean by this that the public demand better mileage and better looking cars than those that are now in service throughout the country. One of the first questions we are asked is—how many miles can you get on one charge, and then—how fast will they go?

All of our twelve cabs now in service are being operated twenty-four hours a day with two drivers; each man working twelve hours. To enable us to operate our electric cabs twenty-four hours a day, we have had installed at the edge of the sidewalk at the Hotels Statler, Tuller, Griswold House, and Pontchartrain charging boxes, and our cabs, while standing idle, are on charge. The Edison Illuminating Company of Detroit has co-operated with us in every way possible, and has given us power wherever it was possible to do so.

We feel that we have constructed for our service a thoroughly up-to-date, practical electric taxicab. Some eight years' experience with the gasoline car taught us the weak points of the gas car, and we have tried to overcome them with our new construction.

Our cab has a 121-inch wheel base, and the interior of the cab body proper has a space about 68 inches long and about 50 inches wide, which you will see enables us to carry from four to five passengers very comfortably. Our experience taught us that the limousine type of body was preferable to the landaulet type, and could be operated with less expense. We are using Silvertown Goodrich pneumatic tires, and have already made a wonderful mileage showing with these tires.

In conclusion, our operating cost per mile up to the present time has not exceeded twenty cents. This cost includes drivers' wages, overhead, tire expense, garage expense, depreciation and every expense in fact which is incidental to the operation of the taxicab business. The only point on which we are uncertain is the life of the car.

We feel that the car has been so well made that we may be able to depreciate this car over a period of ten years. This, of course, is a problem which time alone will tell whether or not we are correct.

It will be my pleasure in Cleveland to answer any questions, which the members of your association may see fit to ask me.

The Spirit of Co-operation

Editors of ELECTRIC VEHICLES:—In the last few months the Garage Owners' Associations of several states in the Union have appointed committees to wait upon the manufacturers or their representatives in different cities for the purpose of bringing about a better feeling between the manufacturer and the garage owner.

This is one of the most important moves possible for the garage owner to make at this time, for the reason that there must be absolute harmony, good fellowship and co-operation, between these two branches of the industry, otherwise the entire industry is going to suffer and the garage owner is going to be a loser.

We have had an example of this situation in Chicago in the last year, and I am sorry to say that these conditions were allowed to continue as long as they have without taking steps to bring about a better feeling.

The situation has been somewhat cleared up in the electric vehicle field in Chicago and suburbs, and we believe that through the influences of the Electric Vehicle Association of America, a satisfactory understanding will be arrived at, and the electric garage owner will be placed back in the position he was in a year ago when the manufacturers' representatives and the garage owners were working harmoniously together. Both of these interests are identical and unless one has the co-operation of the other, both must fail.

A little over a year ago electric car manufacturers' representatives in Chicago were doing everything in their power to assist the garage owner. I can well remember the stand that was taken by Messrs. Whipple, Higginbotham, Temple, Buck, Reed, Barnham and others, at our meetings where they educated the garage owner up to the point of showing him that on account of his overhead he could not maintain the standard of service required by electric car owners for \$35 per month, and these men night after night stiffened the spines of the garage owner and forced him in their arguments to increase the price to a living wage of \$40 per month.

These men went so far as to show the car owners that we could not maintain our overhead as garage owners and give the service they required and take care of electric cars on a \$35 rate and it was only through their influence and co-operation that we were enabled at that time to secure \$40 per month.

Mr. Whipple and Mr. Higginbotham and some of the others went out of their way considerably to help us at that time and too much praise or credit cannot be given these men for the work they did for the electric and combination garage owner during this period.

We now feel that we are about to return to those good old days where harmony and good fellowship prevailed and that it will not be long until that same good feeling which existed at that time will prevail again. I am perfectly well satisfied that the garage owner is anxious to co-operate with the manufacturer, and I really believe that the manufacturer is ready and willing at this time to not only co-operate with the garage owner, but to assist him in securing his just rights.

Every garage owner throughout the country should put his shoulder to the wheel and everything within his power to bring about a better feeling between these two allied interests and I sincerely hope that every garage owner will consider himself a committee of one to do all in his power towards this much-desired end.

ROBERT BLAND,

President Associated Garages of America.

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Volume VII

CHICAGO, NOVEMBER 1915

Number 5

Electric Garage Troubles and Remedies

IT IS common knowledge that the electric garage business throughout the country is in a very unsatisfactory condition and there is probably not an owner with an efficient accounting system who does not know he is not making money; yet, because of vicious competition they go on supplying the public with service for which they are not paid or even thanked. They are losing money, but on the principle that "nothing succeeds like success," they continually claim that business is fine, until they succeed in selling out to some dupe who has more money than experience.

The public has an impression that garages are making a lot of easy money, and many owners of electrics are continually trying to beat down garage charges, which are already much too low. Meanwhile some short-sighted garage owners are cutting prices much below costs in an effort to beat their competitors, while at the same time they may be beating their customers by charging for fictitious repairs.

Every garage must keep some one to make minor repairs but it seems an economic waste for garages to run repair shops when the dealers in cars must necessarily be better equipped, and can make major repairs at less expense. Right here comes in another difficulty with the dealers' repair men. When anything goes wrong with a car, it is a common practice for these men to lay it to the garage. This makes the owner dissatisfied; he reports what the dealers have said and takes his car to some other garage. The results are obvious.

What are the remedies?

First. Garage men should get together and establish living rates, and should obtain an agreement with dealers in accessories and also in cars, to refuse trade discounts to any one who cuts rates.

Second. Dealers should be absolutely fair with garage owners, and should heartily support their efforts for betterment.

Third. Garage men should be fair with each other, and should stand firmly together against unprincipled rate cutters. The elimination of a few of these undesirables in a large city would place the business on a sound basis and greatly benefit dealers and garage owners and it would ultimately benefit car owners as well.

Fourth. Garage men should be honest with their customers. This proposition cannot be wholly accomplished while flat rates are in vogue; for under this system the man who owns a good car with good batteries must pay the deficit caused by his neighbor's worn out car, or junk battery.

For this condition, measured service is the logical remedy. The principal obstacle to the adoption of this system is the initial cost of meters; but this might be met by charging for electricity according to the mileage; and by having only two or three meters by which once or twice a month to check up the different cars.

Gas garages charge from \$25 to \$30 per month or even \$35 for limousines, for the general care of cars, which includes storage, washing and cleaning. They charge extra for any spe-

cial service or repairs, and they make profits on many accessories. They do not furnish gasoline except at a profit and they do not make free deliveries of cars to the owner's house, as electric garages do.

It requires more work properly to care for an electric car than for an open gas car and about as much as for a limousine. The space required for an electric is as great as that for a gas car, although the latter is longer; for electric cars cannot stand so closely together because of injury to each other in opening of doors, when moving or cleaning the cars. Therefore, to the ordinary charge for keeping a gas car must be added the cost of electricity and that of deliveries to and from the owner's home.

In order to demonstrate what this cost is, under the title "Measured Service" we will print some facts in our next issue giving exact records from twenty average cars kept in a garage, where an efficient system of accounting is followed; where each car has its own meter; and where every item is charged to its proper account.

Battery Rental System Promising

RENTING batteries for electric passenger cars is the latest and most promising feature introduced by electric car manufacturers and dealers.

The new system, if properly introduced to the public, will offer unlimited advantages in securing an abundance of interest—and the good electric car surely needs interest and lots of it at the present time.

As adopted by those manufacturers who are testing out the new method, electric vehicles, both passenger and commercial, are being marketed with or without batteries. This permits the purchaser either to buy his battery outright, or to take advantage of the opportunities afforded by the rental system. A complete discussion of the details concerning this method appears elsewhere in this issue.

The battery rental system has three principal advantages. First, it reduces the initial selling price approximately three hundred dollars. This alone means much; especially to the customer who finds the high price the only reason for not purchasing an electric.

Second, the new system eliminates expense and trouble on the part of the owner in the upkeep of his battery. At present the owner is constantly wondering why his battery is not efficient, if it is being charged properly, if it needs washing or repairing, and when he will need a new battery. Under the new system, these considerations are all removed. The garage or the battery rental company assumes all responsibility and batteries receive proper care at all times. The owner constantly has a highly efficient battery delivering maximum mileage and satisfaction.

The third reason is an important one to the trade, both manufacturers and garagemen. Removing the responsibility of battery maintenance to those equipped to care for batteries properly, eliminates the opportunity of unfair argument between the user, garageman and manufacturer. At present if a battery will not stand up in accordance with its guarantee, a complaint is filed by the owner with the manufacturer. The manufacturer in turn shifts the blame to the garageman inferring that the battery has not been properly charged, etc. The garageman, to protect himself, argues that the particular type of battery is not up to the standard in quality. The result is quite evident. The user becomes dissatisfied with the entire combination and he soon becomes a knocker rather than a booster.

The only disadvantage of the new system is the method by which it is being introduced to the public. In order that a battery rental company may live up to its guarantee and earn a fair profit, it is quite evident that a large investment must be tied up in batteries and parts. To establish this system properly would entail considerable capital. The logical rental concerns should be our large battery manufacturers. At present, however, very little interest is being evinced by battery manufacturers, not because they fail to see the advantage of the system, but because they are already overcrowded with orders for war materials. It is hoped that after the great conflict is ended, the interest of the large battery concerns will be concentrated on the new method, which we believe will in turn put the electric on a much broader and more advantageous basis.

The Alienated Affections of the Battery Men

THE European conflict is proving as injurious to electric vehicle manufacturers as it is beneficial to gasoline car manufacturers.

The latter are working shifts night and day to fill orders for war vehicles. Electric car manufacturers are working just as hard to secure enough business to keep their shops open.

What is still worse, the allied manufacturers, especially storage battery manufacturers, because of their thousands of orders for lighting batteries to equip war vehicles, batteries for submarine propulsion, searchlights, etc., have almost forgotten their first love, the electric vehicle battery.

The natural result of this new direction of activity is quite evident. All hands, all effort and all attention are concentrated on the war demands. This mass of business—which is not electric vehicle battery business—with its accompanying revenue, well illustrates the thought that money talks. However, this new business is temporary and not permanent. It has tempted many manufacturers even in other lines of endeavor to concentrate exclusively on war orders, completely neglecting those established lines of trade, which did before the conflict started, and will after it ends, constitute their greatest source of sales.

The battery manufacturer has spent many years in supporting and promoting the electric. He may find, when he is through running after strange gods, a once devoted industry grown cold. The public will have lost interest. The manufacturers of electric vehicles will have been obliged to seek paths of less resistance. A promising industry and a good vehicle will have scraped acquaintance with the hallmarks of unsuccessful venture.

To let go of an established business to grasp something that looks bigger and better is a not uncommon incident in commercial history. Twenty-five hundred years ago Aesop told the story of the dog who stood upon the bridge with a bone in his mouth and coveted the larger bone he saw reflected in the stream beneath. The laws of Nature have not changed. The thing already achieved, once relinquished, is swept away in the hurrying current of progress, and too often the new prize for which we reach proves but a mirage, or at best an evanescent thing that dissolves in a brief while, leaving nothing.

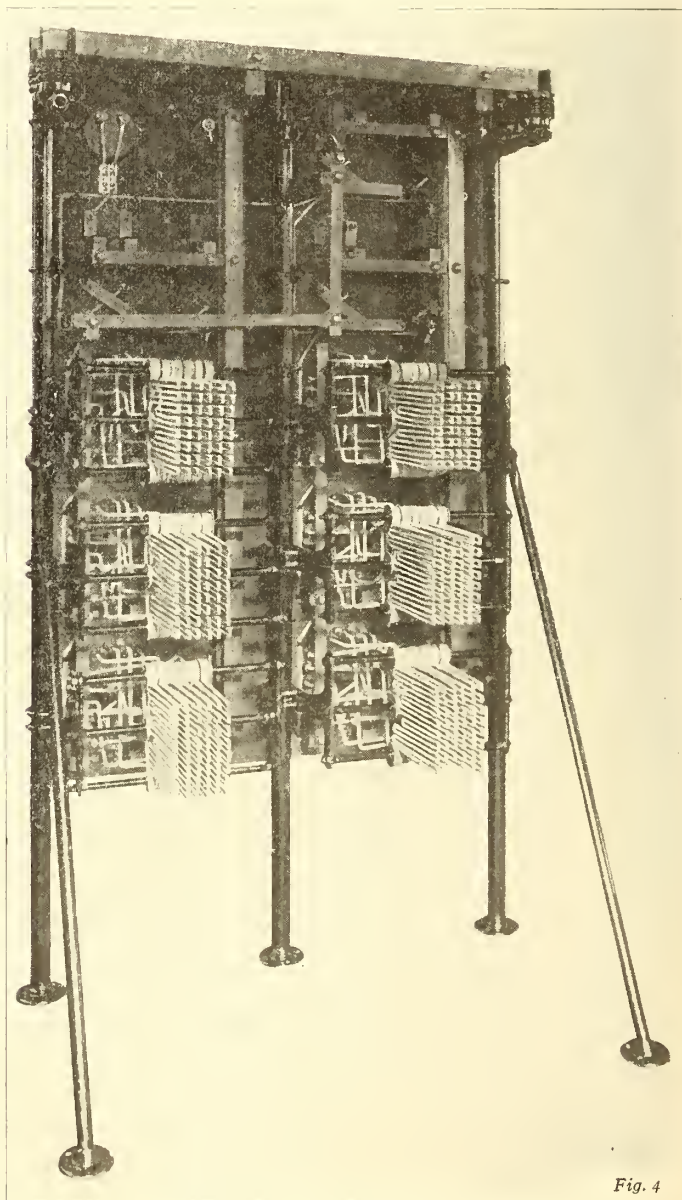
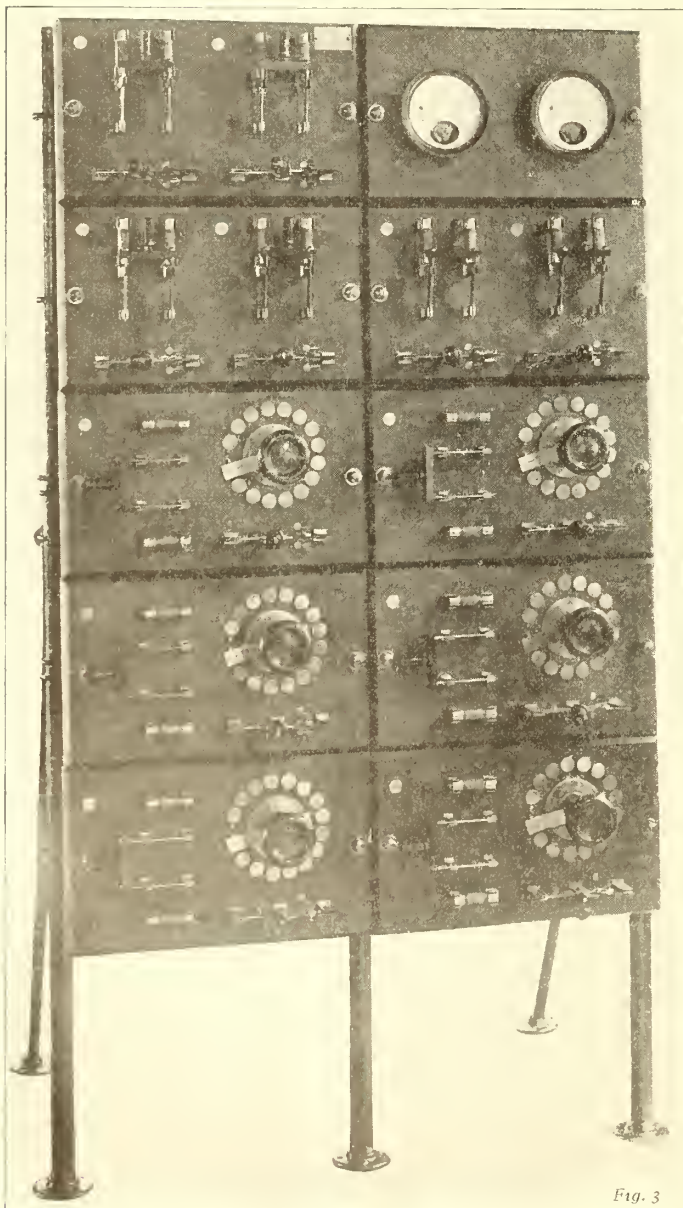
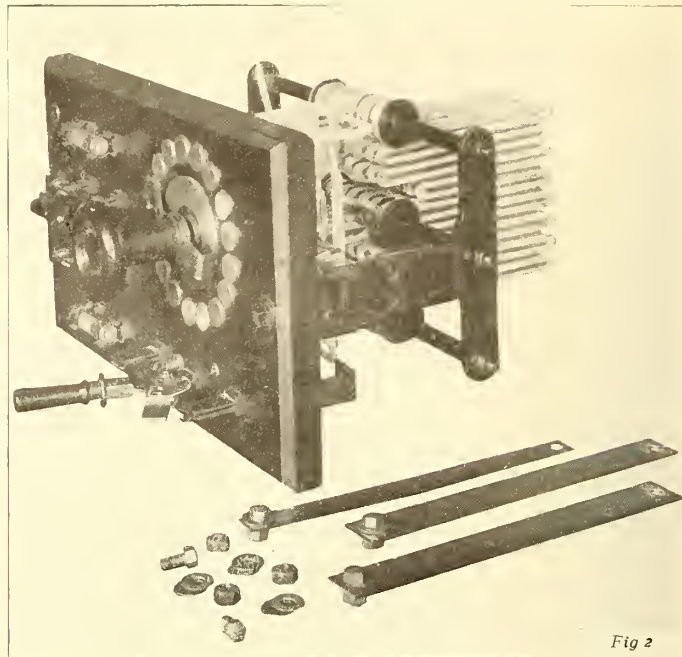
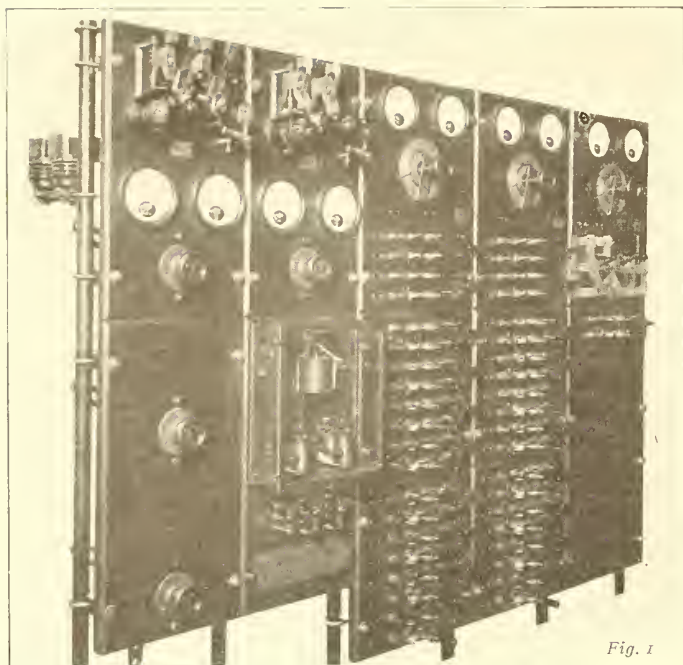
The electric vehicle business stands for a good many thousands of dollars a year to the battery manufacturers. Yet inquiries as to the future plans in the vehicle battery field bring up against a stone wall of war orders and shops working overtime. Why advertise batteries in an electric vehicle trade paper when business comes from Europe without advertising? When the war is over there will be time to give to the vehicle question. No doubt the old business will wait, suspended, as it were, in mid-air, until the new is disposed of.

If the battery manufacturers are just now enjoying unexpectedly large dividends, so much the more opportunity for putting back into the business the profits of the old trade. If the new business makes for temporary prosperity, the old line is its only insurance against collapse. A constantly developing and progressive industry, like that of electric vehicles, means good business forever if it is properly served—and an irreparable loss to commerce if it is neglected.

The Value of Organization

SUCCESSFUL concerns attribute their success to systematic organization. In selling electric cars, organization is a valuable factor. The branch manager who keeps his salesmen organized and working consistently as a unit, is bound to show results. In the electric car industry, organization and system are of special weight, because the average salesman working on a straight commission basis is often tempted to employ any method, fair or unfair, to close a deal. If the company for which he is employed has an organization and a standard policy, he is obliged to follow those rules which are bound to build up a reputation of fair selling—one price to all. This is the kind of a reputation which appeals to the public.

At the present time many electric car manufacturers unknowingly and because of lack of organization, permit their salesmen in the field to employ any tactics whatever in selling. The result is evident. Various prices and various promises are granted to various customers. The world is small and when the public becomes aware of these methods, the manufacturer's reputation is lost. The policies which the manufacturer desires his dealers to carry out are often ignored. The manufacturer must suffer; and undeservingly. With proper organization to dealers and between dealers and their salesmen, such conditions could never exist.



Recent Developments In Charging Apparatus

Improvements in Equipment for Private and Public Garages.

REALIZING that the success or failure of electric vehicles is dependent upon the ways and means of charging the vehicles, the Fort Wayne Electric Works of General Electric Company has recently developed a complete line of charging apparatus, a brief description of which is presented herein.

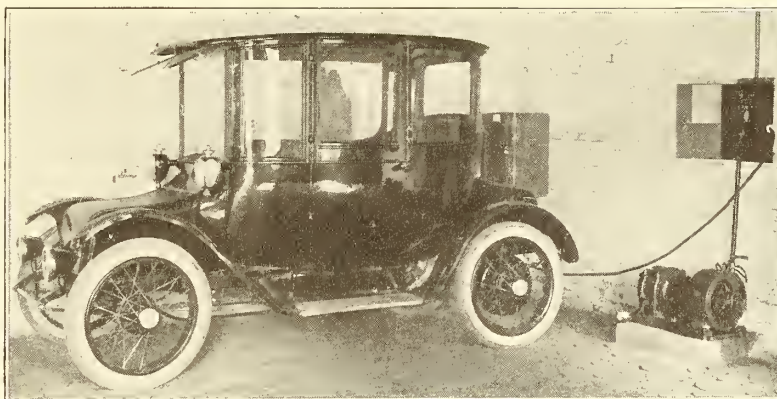
One development is an outfit for charging the individual car in the private garage, an installation of which is shown in the accompanying illustration. This outfit is made up of a standard motor and generator of standard mechanical design, thousands of which are in daily use, assembled on a cast iron base in three-bearing construction, and a slate panel assembled in a knock-out steel cabinet, making the outfit very simple and inexpensive to install. These outfits are designed and carefully adjusted to give a taper charge of a characteristic best suited to the charge of the battery, but in the case of the nickel-iron type cell, if it is desired to charge at a constant rate, a set with proper characteristics can be furnished. The feature of these sets that appeals to the car owner is their simplicity of operation, and the fact that they are practically fool-proof. All that is necessary to do to charge a car is to insert the charging plug and close the switch, allowing it to rest momentarily in the starting clip. The car will start to charge at approximately 30 to 35 amperes, depending on the condition of batteries, and taper to 10 amperes or less in eight to ten hours. No further attention is required to the set until the owner is ready for his car, as the low rate at the end of the charge will not damage the battery if left on a considerable length of time after the charge is complete. It is recommended, however, that the set be inspected before retiring and in the morning to see that everything is correct.

Although as fool-proof as possible owners should make it a point always to note the condition of the battery. These sets can be furnished for various frequencies,

BY A. W. SHARP

110 and 220-volt, single, two- or three-phase current.

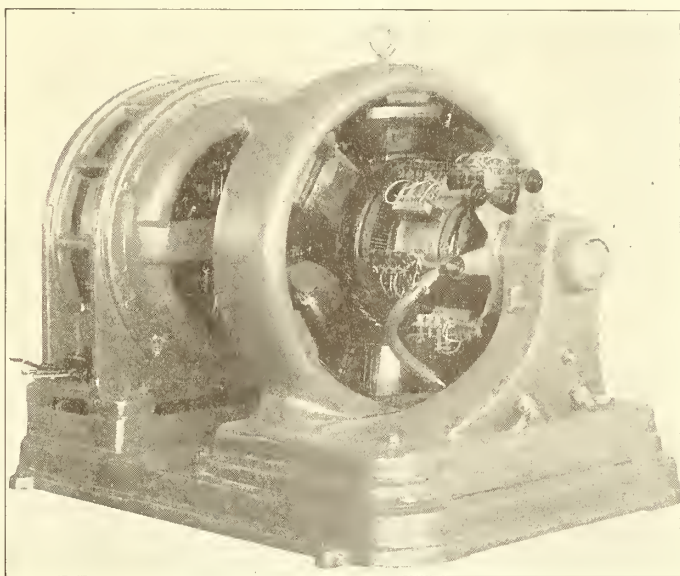
The other development is apparatus for large garage equipment. Motor generator sets of all capacities, and of any voltage, phase, or frequency can be furnished. A 25 kw. set with three-phase, 220-volt motor is shown in the



G. E. Charging Apparatus for Private Garages.

illustration. For the switchboards there has been developed a sectional or "bookcase" unit type. By providing various capacity generator sections, regulator sections, instrument sections, swinging bracket and stationary charging sections with individual rheostats, constant potential sections with master rheostat and instruments, and constant potential sections with switches only, a charging board to suit any condition from standard units can be made up. A great many customers have ideas of their own which they wish to incorporate in the equipment, and the designers are always ready to work with them to this end. A few recent installations are shown in the illustrations.

Figure 1, opposite page, shows a constant potential switchboard control for two 25 kw. motor generator sets, equipped with a type TD regulator and adjusting rheostats, circuit breakers on each generator equipped with overload and reverse current control and three circuit panels, two of which are equipped for the control of ten constant potential circuits, and the third panel equipped for two constant potential circuits with room for a number of other circuits. One of these latter mentioned circuits is of extra heavy capacity for boosting service. Each circuit panel is equipped with an ammeter and voltmeter and with one series rheostat of 150 amperes continuous capacity.



A 25 kw. Set with a 3 Phase, 220 Volt Motor.

One feature of these constant potential boards is the way in which a master rheostat is used, and meter readings are taken. Each circuit has a double pole line switch and two quick-acting heel-and-toe switches. One of these has a spring return and is used for taking simultaneous readings of amperes and volts, the spring

return preventing any chance of trying to take instrument readings on more than one battery at a time. The other switch connects a rheostat shown at the top of the board under the instruments in series with the battery. This is used to cut down the high initial rush of current, keeping the maximum demand on the motor generator set or line down to a reasonable amount, or to protect the set or line in case of a strange car. More than one rheostat can be furnished if desired, so that a rheostat for each two or three circuits will be available.

Illustrations No. 3 and No. 4 show the front and back views, respectively, of a board built for an electric vehicle manufacturing concern to be used in the battery forming room. A total of twelve circuits are controlled, six of which are each equipped with series rheostats of 60 amperes continuous capacity, and the other six are arranged for constant potential charging without any rheostats. Each circuit is protected by a fuse in each side of the circuit. The current and voltage can be read on each circuit by means of the heel-and-toe knife switch with spring return.

Note the simplicity of the wiring and the symmetrical character shown on the back of the board.

Illustration No. 2 shows the ease with which any one of the individual circuit panels may be removed from the board shown in the two previous illustrations.

The 150 ampere rheostat section may be used for constant potential service by simply turning the rheostat switch to the "all out position."

Edison Rents Batteries on a Monthly Charge Basis

Thomas A. Edison has developed an entirely new method for obtaining cheap delivery service. By renting his alkaline storage battery at a nominal price per month he has put the electric vehicle within the reach of every merchant and promises to eliminate the horse by making its cost prohibitive when compared to the sure and simple electric motor.

The inventor explained his plan at a private visit of inspection to his laboratory and factories made on Monday, September 20, by the electric lighting engineers of New York and New Jersey. It consists, essentially, in the merchant purchasing his electric delivery vehicle on the installment plan and hiring the battery to run it at a nominal monthly rental. This not only makes the first cost of the equipment very low, but starts a new and very much simpler and cheaper method of operation.

Electricity is one of our few commodities that has consistently and continuously fallen in price for the past decade. The rental system of the Edison Storage battery Company is the first real opportunity for every merchant to obtain the benefits of this cheaper electricity in reducing his delivery.

Representatives of the electric lighting companies of Greater New York and of the Public Service Electric Company of New Jersey, gave the new plan their hearty endorsement and have promised their co-operation and support to a specific sales campaign proposed by the Ward Motor Vehicle Company. Charles A. Ward, secretary and treasurer of the Ward Vehicle Company, told the guests how he was going to make the plan an assured success by offering the "Ward Special," a 750-lb. delivery wagon, for \$875 on easy monthly payments, with one year's rental of the Edison battery included. This offer will be open only until October 31 and the electric light companies have pledged their assistance to a joint cam-

paign with the Ward and Edison interests. The plan is to be tried in Greater New York and New Jersey and may be extended to other cities in the future.

The "Ward Special" is one of the lightest and most durable vehicles on the market. It is equipped with Westinghouse motors, Timkin roller-bearings and Firestone solid tires. The real axle is shaft-driven from the motor, which is placed under the center of the body. The battery is contained in a box under the driver's seat and out of harm's way. The vehicle has a normal loading capacity of 750 pounds and a roomy delivery wagon body.

Big September Business for Detroit Spring Company

To celebrate a record-breaking September business, about thirty members of the Detroit Steel Products Company, Detroit, Michigan, were the guests of General Manager J. G. Rumney, at a banquet given Tuesday, October 19, in one of the private dining rooms of The Detroit Athletic Club.

The September output of the company, including both Detroit self lubricated springs, was the biggest in the history of the company. And from present indications the remaining months of 1915 are going to be no exception to the rule. The September record was a combination of a series of record-breaking months throughout the year.

At the banquet speeches were made by Walter S. Russel, president of the Russel Wheel & Foundry Company, of Detroit, and by R. S. Drummond, vice president of the Detroit Steel Products Company.

During the evening stereopticon views, reproduced from photographs taken by Mr. Rumney on a recent business and pleasure trip throughout the West, were thrown on a screen.

Free Insurance for Goodrich Men

Effective November 1, the 15,000 employes of the B. F. Goodrich Company at Akron, Ohio, will enjoy a system of free insurance provided by the big tire concern. Funds especially set aside to provide an old-age pension, compensation in case of disability and life insurance in case of death.

The life insurance proper is to be taken by the Equitable Life Assurance Society in the form of a policy for each employe, valued at \$500 for the first year of service and increasing \$100 with each subsequent year until a maximum of \$1,000 is reached.

This plan has been described to the employes in a recent bulletin. The pension is to provide for those employes who have earned an honorable retirement in their old age. The disability compensation will afford some protection to the employe during periods of illness, and, with the pension, will be paid for out of funds provided by the company. In announcing the insurance to its employes, the company believes that in providing these benefits the corporation is expanding its plan of developing the mental and physical efficiency and well-being of its employes, so successfully begun in the physical examinations undertaken in 1914. To this end the corporation is establishing its department of health and these forms of social insurance.

The Washington law provides that no one under fifteen years of age may operate a car unless accompanied by an older person.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

FOLLOWING is a review of association activities from September 25 to date, as prepared by A. Jackson Marshall, secretary.

ST. LOUIS SECTION.

On October 15, the St. Louis section held a meeting in the American Hotel Annex, F. E. Stevens, chairman, presiding.

This was the first meeting held under the new officers and Chairman Stevens announced the following committees:

Garage Committee: A. E. Archer, chairman; R. R. Doak, H. G. Brouster.

Papers Committee: M. B. Strauss, chairman; R. W. Leach.

Publicity Committee: C. E. Michel, chairman; T. B. Entz.

Membership Committee: H. B. Marshall, chairman; H. K. MacCarthy.

Advertising Committee: A. E. Archer, chairman; T. B. Entz, R. W. Leach, R. R. Doak and M. B. Strauss.

There was considerable discussion regarding the proposed newspaper advertising campaign, Mr. Jenny of the Anderson Electric Car Company suggesting that the section look into the proposition of having a large illuminating sign which would be the most pronounced and conspicuous sign in the city, this having a number of remarks flashed on it intermittently, devoted to the advantages of the electric over other types of vehicles. The new advertising committee will look into this matter very fully in the coming year.

It was decided that F. E. Stevens should go to the national convention at Cleveland to represent the local section and certain members agreed to stand a portion of the expenses involved in this trip.

PHILADELPHIA SECTION.

At the executive committee meeting of the Philadelphia section at the Philadelphia Automobile Trade Association on September 1 plans were discussed for the October meeting, and it was decided that at this meeting, reports be received from the convention, and work could be started on Electrical Prosperity Week.

WASHINGTON SECTION.

An executive committee meeting was held on October 7 by the Washington section, at which time the applications for associate membership of Messrs. Charles Orme and Edgar Orme were approved.

It was decided at this meeting to hold executive committee meetings the first Thursday of each month at 4 P. M. in the offices of the Potomac Electric Power Company; a technical meeting each month, the second Thursday, at 8:15 P. M. In this connection it was decided that the papers presented at the annual convention should be reviewed at the technical meetings. These papers to be followed by a speaker on some more general subject, as practised last year. It was decided to hold Eva's Party on the fourth Thursday of each month, commencing with October, except in the month of December when the party should be held on the third Tuesday. In the absence of Mr. Watson, chairman of the entertainment committee, Messrs. Bartram and Marsh were instructed to arrange for a duck pin contest to be held on October 28. In connection with the parties, it was decided that should the entertainment committee consider it necessary in individual cases, the price of the party could be raised to \$20 without causing unfavorable comment from any of the members.

J. W. Orme, chairman of the publicity committee, stated that Harry Ward would like to run a special edition of *Motor News* for electric vehicles—stating that Mr. Ward would like to get permission of the association to ask dealers, etc., to advertise in this edition. It was thought advisable to continue the electric vehicle page once a month in the daily papers, and it was decided that it would be best to leave arrangements to the chairman of the publicity committee.

Robert F. Fleming, chairman of the traffic committee, was instructed to familiarize himself with the proposed changes in the traffic regulations and be prepared to report to future meetings, having especially in mind the importance of there being no regulations allowed to be put in force which would be prejudicial to the interests of electric vehicle owners without an active protest on our part. Mr. Fleming was further instructed that if he



Chicago Electric Sold With or Without Batteries.



Chicago Manager, J. H. Horsley, in a 1916 Ohio.

should find any such regulations contemplated he should bring these promptly to the attention of the chairman with a view to having not only the traffic committee, but the executive committee call on the superintendent of police in regard to this matter. In connection with this discussion, it was thought well to invite Major Pullman to speak at one of the early meetings in regard to traffic regulation.

MEMBERSHIP.

The membership by classes to date is as follows:

Active				
C.S. Mfrs.	Associate	Auxiliary	Press	Total
111	27	924	13	30
				1,105

MEMBERSHIP REPORT BY SECTIONS.

New England Section.....	125
Chicago Section	153
Philadelphia Section	79
Washington Section	53
Cincinnati Section	20
San Francisco Section.....	23
Los Angeles Section.....	64
Pittsburgh Section	35
New York Section.....	236
Detroit Section	50
Cleveland Section	31
Toronto Section	17
Denver Section	18
St. Louis Section.....	29
Kansas City Section.....	16
Portland Section	17
Members at Large (abroad)	25
Members at Large (at home).....	114
Total.....	1,105

PUBLICITY.

The amount of publicity in foreign publications which the association has been receiving lately has steadily increased during the past month. The association is in receipt of numerous letters from various European magazines and papers, complimenting the association on the quality of articles released and their wide range of subject. Trade journals in Russia, China, Japan, Germany, France, Italy, and England have been giving a considerable amount of valuable space to the association's publicity.

Numerous articles concerning the convention activities have been written and released during the past month as well as a quantity of publicity on the Ward-Edison electric delivery wagon, and its recent reliability run from New York to Cleveland. All of the convention papers and reports have been assiduously distributed to the press in this country and abroad. A very important article entitled "Electric Vehicles Prove Good Hill-Climbers in Department Store Delivery Service" shows the extremely fortunate experience that a large department store in Portland, Oregon, has had with electric vehicle equipment. Such a large and important installation operating in the hilliest city in the United States should prove especially interesting.

Standardizing Wheel and Tire Sizes

The Society of Automobile Engineers in 1911 adopted a standard of dimensions for all truck wheels and tires. This standard provided a schedule of diameters varying by two-inch steps from 32 to 42 inches and a schedule of seven widths, varying from 2.5 to 7 inches, making 42 possible sizes in all.

The immediate adoption of this standard by all manufacturers of the lines affected, was ample proof of the value of the S. A. E. recommendation.

General practice and thorough investigation conclusively proved such a large variety of wheel diameters

unnecessary for truck efficiency and impractical, for, with the expansion of the industry, tire manufacturers, especially, found it practically a physical impossibility to carry complete stocks and render efficient service in all of the 150 or more cities having at least 25 trucks. As a consequence, in the fall of 1913, the S. A. E. revised its former standard, eliminating all diameters but 32 inches, 36 inches and 40 inches, still retaining the former schedule of widths, thus making 21 different sizes. Strictly speaking, the 32-inch diameter was tentatively retained to take care of a few small electrics, but later recommended for elimination, leaving only the 36 inches and 40 inches and 14 sizes.

The general adoption of this present standard will afford even greater advantages than the former did. Such a simplification will enable tire manufacturers to carry complete stock in all service stations, thus raising the standard of tire-renewal service to the highest point of efficiency; will have a decided tendency to satisfactorily increase export business and aid the progress already made toward an international standard.

Although manufacturers of electric vehicles have not adopted these standards as rapidly as builders of gas trucks, they have showed a decided tendency in this direction. Highly efficient service and low cost for renewal parts are most vital to the success of a general intensive truck sales campaign. Nothing will do more toward bringing about this desirable condition than a complete adoption by the electric vehicle manufacturers of the present S. A. E. standard.

Chicago Section Appoints New Garage Committee

The following is a list of members of the garage committee, Chicago section of the Electric Vehicle Association, for the coming year:

Harry Salvat, Fashion Auto Station; N. E. Lemon, Bland's Garage, 47th street; F. E. Engle, Elite Garage; H. E. Halbert, Garfield Auto Station; Wm. Jones, Jones Fashion Garage; C. A. Criste, Hyde Park Hotel Garage; P. R. Higginbotham, Woods Motor



The Electric Hand Truck Is a Labor Saver.

Vehicle Co., and Robt. Bland, Bland Electric Garage, Evanston.

The first meeting of this committee was called for Thursday, November 11, at which time the most important steps to be taken in promoting the welfare of the electric garages of Chicago will be fully discussed and considered and the program outlined for the coming year.

The Electric Vehicle as a Business Builder

A Paper Presented at the Association's Annual Convention

BY Q. A. BRACKETT

IF THERE is one subject that is more important than almost any other to the modern central station, it is the building up of the off-peak load. During the last decade, the size of central stations has increased by leaps and bounds, and the number of plants throughout the country has increased tremendously. However, nearly all this great growth has been along the line of service that adds mostly to the peak load. Great quantities of additional generating equipment have to be purchased at great expense only to have the greater part of it idle more than half the day. Increasing business inevitably carries with it increasing overhead expense, both for equipment and for service, so that the benefit is largely neutralized. This is especially true of an increasing lighting load, since so many customers of this class really bring no direct profit to the central station, because the yearly income from these customers is too low to pay the company's fixed charges for distribution circuits, meters, meter reading, etc., that are largely independent of current consumed. It is, therefore, extremely desirable to obtain as customers those whose requirements will not only come during the off-peak period, but will be large enough to insure a real profit. It will be found that the electric vehicle owner is one of these.

There are two classes of off-peak loads, day loads and night loads. Much has already been done by central stations towards increasing the off-peak day load. This has largely taken the form of pushing the sale of electric heating and cooking appliances, and the development of the motor load. The former has the fault that it depends on the use of small units, most of which are in service but a short time on each occasion, and not every day by any means. Then, too, they are distinctly in the nature of luxuries in many cases, and this tends to limit their use. The motor load is frequently of low power-factor, and coming on and off suddenly and frequently as it does, it makes voltage regulation more difficult and introduces considerable trouble. Neither of these classes of service can be utilized by the central station itself, but it must all be sold to more or less unwilling customers.

To fill in the light load period between midnight and morning, however, little has been accomplished, although this is the period that needs attention most of all.

There is nothing so well suited for a night load as the charging of storage batteries, since it possesses almost every characteristic to be desired for an off-peak night load, viz.:

(1) It is an all-night load, filling in the worst hollow in the load curve during the small hours of the morning.

(2) It is a long-continued load, that is, not a fifteen-minute load, like

cooking devices.

(3) It is a frequent load that will occur almost every night, whereas a sad-iron in many cases is used but once a week.

(4) All customers of this sort represent comparatively heavy loads, many times greater than the average lighting load, and equal to six sad-irons at the very least.

(5) Battery charging is a steady load of good power-factor and is not subject to sudden changes like a motor load in a factory or machine shop.

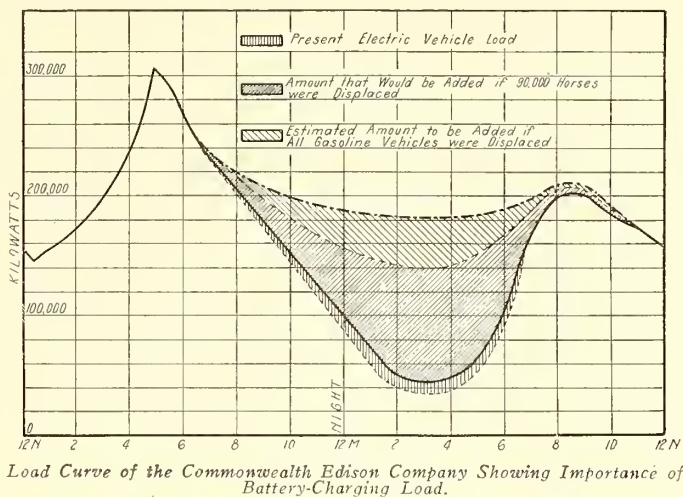
There are a number of things that at present deter the public from using electric vehicles to a greater degree than they now do, and the principal of these is lack of knowledge and example, while the second is lack of co-operation by the central stations.

The first thing that a central station must do to increase the use of electric vehicles in its territory is to make special rates for power when used for off-peak charging, and advertise this fact conspicuously. This will not only encourage the use of electric vehicles by making their cost of operation lower than that of other types, but will psychologically help push the campaign by virtue of the advertising and because it puts the bargain idea prominently before the prospective user.

The second step should be to educate the public as to the advantages of the electric vehicle and its real economy over other types. The general public can and should be educated by a general publicity campaign, including advertisements in the papers, posters, and exhibits at the companies' showrooms, leaflets inclosed with monthly lighting bills, etc. Posters in the street cars are an effective way of reaching large masses of the people, and where the central station controls the street cars, there is no cheaper way.

There is no form of advertisement, however, so effective as example. It is, therefore, of first importance to get the use of electric vehicles started. The first and obvious method is for the central station to introduce them for their own use as repair wagons, etc. In fact, it would be rather useless to urge them upon the public if the central stations did not find them worth while themselves. Then, too, their use by the electric station is self-evidently advisable for the sake of what off-peak load they give even if an actual campaign to interest the public is not thought worth while. Assuming that the central station does adopt electric vehicles for its own use, the example thereby set can be conspicuously advertised on the cars themselves, thus getting the full effect.

The next step after adopting electric vehicles itself



is for the central station to concentrate its efforts especially on one or more of the large interests of the city, who use a number of delivery vehicles. If one such concern can be gotten to adopt electric vehicles and if the central station sees to it that it is so coached on their care and operation as to obtain especially satisfactory results, this will be one of the most effective arguments possible in making others follow the example. There are numerous applications of this sort that have been successful in the past. These are primarily short-haul propositions, such as delivery service for department stores, wholesale houses, etc. Another successful application of electric trucks is for handling the mails instead of mail wagons. As an example of this, note the recent adoption of electric vehicles for that purpose in the city of Boston, by the company that holds the contract for transporting the mails. Not only is this expected to be more profitable for the company than the older method, but it will improve the mail service by quickening deliveries throughout the district. It was this latter consideration that caused the postoffice at Boston to so strongly advocate the adoption of electric vehicles. This shows how outside interests will, for their own advantage, often assist the central station in introducing the electric vehicle.

Another large organization that can usually be persuaded to adopt electric vehicles is the street-railway company for their repair wagons. The same is true of the telephone and telegraph companies. In both these cases, the negotiation is made easier by the fact that since all are in the electrical business, they are familiar with the care and characteristics of storage batteries and are not deterred by the unfamiliarity with them that exists in the mind of the ordinary business man. In fact, other things being equal, these should be the easiest applications to bring about in any new territory after the adoption of electric vehicles by the company itself.

In getting the individual user to adopt the electric vehicle, it may be necessary to do even more than advertise and set an example, and furnish attractive rates for power. The first cost of charging apparatus, low as it is, may deter an otherwise converted customer. In such cases, it may even be advisable for the central station to remove this first cost entirely from the customer's mind, by providing the charging equipment itself for a nominal rental, the customer to pay all maintenance expenses. Two dollars a month would cover the interest and depreciation, for instance, on an average-size rectifier equipment. In cases where it would not conflict with a local agent, the central station might even help its customers save money, by handling the purchase of vehicles for all its customers, and giving them, in the form of a rebate later in the year, the advantage of any quantity discount obtained according to the number of vehicles sold in the district, per year. This would make all the first purchasers boost electric vehicles to their friends for all they were worth, so as to get enough vehicles sold to insure their own discount. The central station would thus have a corps of able men working for their interests for nothing, which, in most lines of endeavor, would be considered well worth while.

For a number of years, a commercial electric vehicle has always meant a fairly large and quite expensive truck which only large concerns dealing in heavy merchandise would buy. Lately, however, light electric delivery wagons, costing less than a thousand dollars, have appeared on the market, and these open a whole new field for the application of electric vehicles to the delivery service of bakeries, grocery and provision stores, light express service, etc., where the one-horse team is so common nowa-

days. The same conditions of economy hold here as in the cases of the larger trucks. The columns of the leading electrical papers have repeatedly shown the greater economy of operation of electric vehicles within their proper sphere over both gasoline and horse-drawn vehicles. This usually amounts to a saving of from 20 per cent to 50 per cent over the cost of operating an equivalent gasoline truck. This means a great deal in dollars and cents in the course of a year.

But the electric truck is only one phase of the electric vehicle proposition. The pleasure car is almost equally important from the central station standpoint, although it usually represents a somewhat smaller unit and one that is charged less often. Nevertheless, the average pleasure vehicle requires about 20 kilowatt-hours per charge, and if charged 15 times a month, this represents at a five-cent rate for power an income of \$180 per year from each car. This is far more than the income from the average lighting customer, in spite of all the sad-irons, toaster stoves, etc., that he may use, even at a 10-cent rate for power. And it is nearly all clear gain, since the load all comes during the small hours of the night when the load is lightest and since it requires practically no new expense on the part of the company.

In the case of the larger commercial vehicles, the load is even greater, averaging, say 30 kilowatt-hours per charge with 25 charges per month, or about 450 per year income to the central station at a five-cent rate.

The superiority of the electric pleasure car for town use, and especially for ladies, is no longer disputed. Its quietness and air of luxury makes it especially appropriate for society use, while its utter cleanliness, its simplicity of operation, and its absolute freedom from operating troubles, such as are liable to occur with even the best gasoline engines with their valves, carbureters, ignition system, gears, etc., place it in a class by itself. This is especially true for the woman who wants to drive for herself, even when gowned in her best for an afternoon party. For doctors, also, who want a car that will be always ready, and never fail to start in an emergency, or for people of quieter dispositions, who have not the mania for high speed or cross-country touring, the pleasure electric especially appeals.

It is necessary, however, for the central station to do more than encourage the use of electric vehicles and provide attractive rates for power. It is necessary to provide facilities for charging the car batteries and to advise the owners as to the proper methods to adopt.

It is unquestionable that some customers will prefer to pay to be relieved of all trouble in caring for their batteries and will have them charged at a public garage. On the other hand, many customers will prefer to save expense by charging them themselves, or will be so situated that there is no electric garage at all convenient. The man who would charge at home, must be helped with advice as to what charging equipment he needs and must be coached in its use, so that he will get good results and not become prejudiced against the electric vehicle because of battery trouble brought on by improper charging.

The man who prefers to have his car charged at a public garage, must be looked after, by seeing to it that a sufficient number of public garages are equipped and trained to give good service along this line.

The charging equipment that is best suited for the man who charges his own car at home, is not necessarily the best for the public garage. The conditions differ widely, and a choice must be made between the various types of charging apparatus that are available.

These are divided into two main classes: motor-

generator sets and mercury rectifiers. The former can be made in any size that is required, whereas the maximum capacity of the latter is 50 amperes, direct current. It, therefore, follows that for public garages, where a large number of cars are to be charged at once, the motor-generator set or rotary converter are the only devices to be considered. These should be chosen of a size large enough to take care of a reasonable growth of business during the near future.

For private garages, where only a single car need be charged at a time, the mercury rectifier is amply large enough to suit all requirements. The choice of a charging device hinges, therefore, on their relative advantages, or the preference of the user. Their relative advantages depend partly upon their inherent characteristics and partly upon the conditions under which they are to be used.

In the foregoing, the writer has endeavored to point out the advantage of developing the use of electric vehicles in the territory supplied by any central station,

showing how the charging of the vehicle batteries brings about an off-peak load of most desirable characteristics and size, and occurring at the time most desirable from the central station view point, namely, during the small hours of the morning.

It has been shown that a single pleasure vehicle will bring in nearly \$200 per year to the central station, while a truck will bring in \$400 or \$500 per year, all for current delivered during the worst part of the off-peak period.

Certainly, this would seem to warrant vigorous and unceasing effort on the part of the central stations to obtain and build up this load and to assist in every way the growth of the use of electrical vehicles. Suggestions have been made as to ways to accomplish this and as to methods of handling the load, once it is obtained.

It is only a question of time before the advantage of the electric vehicle to the central station is universally recognized, and until more systematic efforts are everywhere made to encourage its use.

Selling Electrics on the Installment Plan

Low First Cost for Electric Delivery Wagon, with Battery Rental Service at So Much per Month

THE New York Edison Company, the United Electric Light & Power Company, the Edison Electric Illuminating Company of Brooklyn, the New York & Queens Electric Light & Power Company, the Flatbush Gas Company and the Public Service Electric Company of New Jersey are at present actively engaged in a campaign having for its object the wider application of electric vehicles in their respective territories.

As announced in these columns September 25, a plan has been inaugurated by the Ward Motor Vehicle Company of New York whereby a dependable electric delivery wagon may be purchased in New York City and New Jersey for \$875 on a deferred-payment plan covering one year. This price includes also the first year's rental of an Edison storage battery.

The vehicle, which is shown herewith, has a normal loading capacity of 750 lb. It is equipped with a heavy-duty series-wound Westinghouse motor, driving through a propeller shaft to the rear axle, and has a sixty-five-cell G-4 Edison storage battery. The battery is contained in a box under the driver's seat. At a speed of approximately 10 miles per hour, the radius of action of the vehicle ranges from 35 to 45 miles per charge. There are semi-elliptical front and rear springs and the front axle is of drop-forged steel with Timken bearings. The rear axle is a pressed-steel housing on helical gears with Timken bearings. Four speeds ahead and two on reverse are provided by the continuous-torque controller.

It is the intention of the vehicle manufacturer, backed by the sales organization of the central-station companies mentioned, to interest bakers, grocers, butchers, laundries, etc., in this vehicle. Hence the builder of the vehicle has had a rectifier developed which gives a tapering charge so that the battery cannot be abused. By the terms of payment the customer pays \$44.50 on the signing of his contract, \$296 on the delivery of the vehicle, and the balance in twelve equal monthly installments of \$44.50. These latter payments are arranged in the form of notes, bearing interest at the rate of 6 per cent per annum. By this means the burden carried by

the vehicle manufacturer is lightened considerably, the paper being available for discount if so desired.

The battery which forms part of the vehicle's equipment is, as already stated, of the sixty-five-cell G-4 type. It has a rating of ampere-hour and a normal charge and discharge of 30 amperes. The average weight per cell, including the tray, is 12.5 lb.

After the completion of the first year the owner of the vehicle pays the Edison Storage Battery Company a



750-Lb. Ward Electric Delivery Wagon Which Sells for \$875 on a Twelve-Installment Payment Plan, With Battery Rental at \$10.50 Per Month.

monthly battery rental of \$10.50, provided that the odometer does not record more than 625 miles in that month. For all excess mileage over 625 there is an extra charge of 13½ cents per mile. Vehicles of the type offered have been in use for some time.

At present a vehicle of this type is making a run from New York to Cleveland. This vehicle started from the Grand Central Palace, New York, at 2.30 P. M. Octo-

ber 6, coincidentally with the opening of the annual Electrical Exposition and Motor Show, and reached Peekskill, N. Y., the same evening. The next day it ran through to Albany, N. Y. According to the report of the expert of the New York Electric Vehicle Dealers' Association who is accompanying the vehicle as official observer, 111 ampere-hours were consumed in making the run from the Grand Central Palace to Peekskill, a distance of 45 miles. At Ossining the battery was given a boost of 80 ampere-hours for one hour because it was found necessary to make a long detour from the main road in order to reach Peekskill, this detour including bad roads and heavy grades. On the road from Peekskill to Albany the vehicle, which was carrying its rated capacity of 750 lb., stopped at Poughkeepsie to receive a boosting charge.

As yet the campaign started by the sales organizations of the central stations of New York City and New Jersey have not been under way long enough to show results, but it is expected that by the time the offer expires—that is, October 31—a large number of vehicles will have been sold. At present they are selling at the rate of three a day. Each of the central-station companies has a large number of electric-vehicle "prospects" whom they feel certain will be interested in the proposition. There are a large number of the vehicles already in operation in the territory of the Public Service Electric Company of New Jersey which were put out prior to the present campaign. In that territory the company has found a number of customers who prefer to pay for their vehicles outright. It is expected, however, that the deferred-payment plan for the vehicle itself and the monthly battery payment will be greatly instrumental in successful sale of a large number of the vehicles.

A fund of \$10,000 has been pledged by the vehicle maker and the central-station companies for advertising the offer in the press of New York City and in the territory of the Public Service Electric Company of New Jersey. Cars for demonstrating purposes are available to the central stations on request, and in addition there is an exhibit at the Electrical Exposition and Motor Show in New York City.

Central Stations Find Great Success in Electric Floats

As the "opening gun" in its fall house-wiring campaign, the Metropolitan Electric Company, Reading, Pa., fitted up one of its electric trucks to represent a bungalow without a chimney. In order to attract attention to this float and to arouse interest in the campaign, the slogan "The House Without a Chimney" was adopted and painted on the sides of the float, together with a notice of the coming campaign. The electric truck was decorated with miniature electric lamps and a string orchestra inside the "house" played popular music as the truck made its way through the residential districts. In the business section of the town the truck was stopped from time to time at favorable locations while impromptu concerts were given.

Ward Makes 733.7 Miles on 1,564 Ampere Hours

The longest cross-country run ever made by an electric commercial automobile has just been completed by a Ward stock delivery car between New York City and Cleveland, O. This remarkable test run was made under the auspices of the New York Electric Vehicle Associa-

tion and the latest type of storage battery invented by Thomas A. Edison was used.

The car was started from New York on the afternoon of October 6 in connection with the opening ceremonies of the Electrical Exposition and Motor Show,



Some of the Road Conditions Which the Ward Negotiated.

the driver bearing a letter from Arthur Williams, president of the exposition, to Cleveland's mayor. During the exposition, which lasted ten days, eager crowds awaited bulletins which told of the successful progress of the car. On Wednesday, October 13, it passed through Buffalo, and on Saturday evening, October 16, the closing night of the exposition, a telegram came which stated the electric would arrive in Cleveland the following morning. The message was greeted with enthusiasm by a record crowd at the exposition. On Sunday, October 17, just eleven days after the start, the little covered electric delivery wagon noiselessly entered Cleveland, having covered a distance of 733.7 miles.

According to John F. Delehant, of the New York Electric Vehicle Association, who accompanied the car as official observer, the run was made without a mishap or without an adjustment being made on the car. The total running time was 84 hours and 43 minutes, the average running time was eight and one-half miles per hour.

One of the startling features revealed by the run was that only twenty-five charges of battery were necessary for the entire 733.7 miles, the total current consumption being 1,164 ampere hours. Much valuable data was secured on the run, which has demonstrated with-



Clay Roads and a Heavy Rainfall Made Great Demands on the Battery for Power.

out a doubt that the modern electric vehicle is master of all conditions. It is no longer a delicate mechanism, but a hardy and powerful machine, capable of fighting its own way over the roughest roads and through mud and rain.

Battery Rental System Proves Successful

Walker Vehicle Company Claims New Method Will Bring Universal Adoption of the Electric

A LITTLE over a year ago a new battery maintenance plan was undertaken in a number of isolated cases on electric pleasure cars in the city of Chicago. The results obtained from these plans were closely watched by the Walker Vehicle Company, for the company felt just as many other electric vehicle manufacturers have, that if the battery maintenance cost could be reduced, a most important step would be taken toward the successful promotion of the sales of more electric vehicles.

It is true that the largest single item of maintenance expense in electric vehicles, has been batteries, and the first step taken to assure the consumer of better service at lower cost, was a form of guarantee placed on the batteries, which pro-rated the renewal cost according to the service received from the battery.

All have realized the necessity of lowering the high list prices that have held on pleasure electrics in order that larger production could come and in considering this, the high cost of batteries again proved an important barrier.

In the past year through the introduction of low priced gasoline cars with self-starters, electric lighting systems, etc., it was brought home to electric vehicle manufacturers that more aggressive steps would prove necessary if the electric vehicle expected to hold its own and sales receive the stimulus they needed.

Before considering the adoption of the rental battery system, the sales requirements were not only thoroughly considered but the practical operation of several battery rental systems was investigated. This investigation brought to light some very interesting data and information on isolated cases of battery rental service. In one case a commercial car was put into service of this nature seven years ago, which afforded sufficient proof as to the feasibility and practicability of renting batteries. The service afforded this car is still proving satisfactory and economical. The service was based on ampere hours output but did not cover renewal or repairs of jars and trays, these items being charged as extra, when they were required.

The data on this particular case together with several others, proved that basing the rental on ampere hours output, or any means upon which meters were utilized, proved unsatisfactory to the rental company for the reason that meters and odometers are very frequently out of commission and for that reason make accurate records extremely difficult to secure.

The first company in Chicago to consider the rental system on an organized basis was the K. W. Battery Company, and in considering the above isolated systems used, it found that the most satisfactory basis upon which to operate was that of time; on which there was no question as to keeping accurate records.

The K. W. service for that reason was based on the question of time and from its standpoint, this has proven most satisfactory in every respect. As mentioned above, most vehicle manufacturers and battery manufacturers have adopted a form of battery guarantee for the last two years which guarantees

BY GAIL REED

were based on a time service and it was found that batteries could be rented outright on a time basis and net the battery company as much, if not more, than selling batteries outright and taking into consideration the adjustments necessary to assure the service stipulated by the guarantee. In other words, a vehicle manufacturer or battery manufacturer selling batteries with a guarantee attached, found it necessary to set aside a certain percentage for maintenance in making good adjustments which amount if set aside on a rental battery proposition, would more than cover all requirements. In this respect, the rental battery proposition has the advantage in that the rental battery company is notified more quickly if any attentions are required, for the owner paying per month for full service expects full efficiency at all times and when this is lacking, the rental company receives his report immediately.

In figuring the proposition from the rental company's standpoint, two methods can be adopted, first, by dividing the monthly income into dividends on capital invested and a maintenance reserve, or by considering the rental battery as a sale and the income as deferred payments until the cost of the battery has been covered.

Inasmuch as all battery companies have large stocks of plates on hand at all times, the increase in capital for placing rental batteries on the market need not be so large as would at first appear. The capital necessary to placing these plates in operation would be the amount required for labor in building up the batteries. The result would be that instead of large stocks of plates being stored for future use, they would be placed in service and bringing in their cash returns. Judging from the experience which the K. W. Battery Company has had in Chicago covering the past year, it has been proven that the average profit to the battery company on rental batteries will prove as large as on batteries sold on a guarantee basis where the guarantee is lived up to.

Since the rental battery service was inaugurated, the K. W. Battery Company has shown an increase of at least 100 per cent on the business done for the last six months over that of the first six months, indicating clearly the favor with which such service is meeting. The most serious handicap encountered to date from the standpoint of service as well as the cost of operation, has been the great diversity of tray and battery jar arrangements in the several makes of electric cars. In a great many cases the same maker will have different tray arrangements for every model and in a number of cases the same model will have different size jars for the same number of plates. The handicap of this lack of standardization is very evident to everyone in the electric vehicle industry but it is brought home more seriously when attention is given the rental battery service proposition. Until a standard has been adopted by manufacturers of electric vehicles, it will continue to prove a very serious handicap to the furthering of rental batteries on any but a very limited scale.

The investigation of the Walker Vehicle Company,

previous to recommending the rental battery system, showed that those using rental batteries had been more than pleased with the service and satisfied in every way with the economy of the proposition as a whole.

Several of the users of the pleasure cars manufactured by the Walker Vehicle Company, have installed the rental battery service and investigation proved that they would not give up this service for any other under any consideration. In fact the company received numerous strong recommendations from these people to install such a service for its owners.

The basis upon which rental batteries are furnished the users is given here.

In the first place, a deduction of \$270 is made from the list price of the car, which means that much less outlay in the purchase price. This deduction alone will cover the cost of rental battery service for a period of a year and a half to two years. Where old battery or a battery of any kind is turned in with the car for a new rental battery, the price is \$16 per month for an 11-plate 40-cell battery.

When a car is turned in without battery and the rental battery is procured, \$4 per month extra is required in addition to the regular rate given above the first year. However, the Walker Vehicle Company has made arrangements whereby an additional payment of \$25 is required with the first month's regular battery rent and in the case of the 11-plate 40-cell battery, which is the customary size used, this would make the first month's payment \$41. Thereafter the regular rate of \$16 per month holds good. By this plan, the customer is saved \$23 on the first year's rent.

The understanding which the rental people give covering the battery is as follows:

The customer has the right to lay the car off for two months during the year's contract for which time there will be no charge for the battery after the customer has given the specified number of days' notice that the battery has been taken out. The capacity of the battery in ampere hours will be guaranteed to be kept up at all times when fully charged in such a shape as to deliver 80 per cent of the full rated capacity.

The rental battery company will make repairs of all broken jars, terminals or such minor repairs as are necessary from time to time to keep the battery in good operating condition. In other words, the amount paid per month to the battery rental company will cover all expenses and will provide the customer with a battery in prime condition at all times. Whenever the battery, through use, fails to give the required mileage, a new battery is put in. The customer agrees to accept the responsibility for the loss of the battery in case of fire, theft or collision.

The battery rental company agrees also that a deduction may be made from the rental if the battery is out of commission for more than 24 hours after notification by the owner of the car that the battery is in need of attention.

The customer agrees to have the battery charged regularly and to give it reasonable care as to flushing and charging. The rental battery company has the right to inspect the battery at the customer's garage at a reasonable time and further has a right to remove the battery from the car without notice at any time upon failure of the customer to pay the regular rent.

The customer saves \$270 on the first cost of the car, which alone pays for more than the first year's rental service. Figuring the cost over a period of two

years based on 35 miles per day or an average of 12,000 miles per year, we have the following:

Buying Battery with Car		Cost Per Month of Rental Battery, \$16.00	
To begin with.....	\$270.00	1st year including \$25.00 extra	\$217.00
Washing and incidentals	75.00	2nd yr. \$16.00 per month	192.00
End of first year for renewal	270.00		
Washing and incidentals	75.00		
	<u>\$609.00</u>	Deducting \$60.00 for time not in use.....	<u>\$409.00</u>

In other words, \$341 saved by a rental battery on this basis.

These figures are based on 12,000 miles running which would necessitate an average purchase of a new battery every year and clearly shows the big saving made by the rental battery system.

This saving would not be so evident with users who average but five or six thousand miles per year, but even on this basis it proves an economy as the following will show:

5,000 Miles		Cost of Rental Battery Per Month \$16.00	
Buying Battery with Car		1st yr. including \$25.00 extra	\$217.00
To begin with.....	\$270.00	2nd yr. \$16.00 per month	192.00
Washing and incidentals	75.00		
1st year	75.00		
Washing and incidentals	75.00		
2nd year	<u>\$420.00</u>	Deducting \$60.00 for time not in use.....	<u>\$349.00</u>

On this basis \$71 is saved.

Even granting that incidental expenses and a wash would not be necessary in the second year's life of the battery owned by the customer, the rental battery system would have cost no more and on the old system, at the end of the two years, the owner would find it necessary to invest in an entire new battery in order to assure future service for another two years. The saving in dollars and cents on the rental service battery basis is of little importance compared with the fact that the owner would have the advantage with the rental battery of continued full battery service.

With the rental battery, capacity is guaranteed, and when it has reached a point that sufficient mileage is not gained, a new battery is put in, thus assuring the user of a rental battery, continued high efficiency at all times.

Most owners of electric cars will spend from one to two months out of town per year, at which time their car is taken out of service. In the case of a rental battery, during this time a deduction is made and for the time their car is out of use, their battery cost stops.

The customer is also assured against any mishaps in regard to treatment and care of his battery, through the rental battery system for the rental battery company is responsible for keeping the battery in prime condition at all times. In the case of the customer owning his own battery and through mistreatment or inattention its life is impaired or deterioration sets in, he alone is responsible. While all modern batteries have been vastly improved in respect to washing requirements, it still becomes necessary in a great many cases for a wash job after seven or eight thousand miles have been covered. This entails another expense on the man who owns his own battery, which is eliminated through the rental battery system.

The battery rental system is well deserving of serious consideration, by both manufacturers of vehicles and users. If it proves as successful as it promises, a great saving will result and greater merits be established.

Electrical Manufacturer Builds Garage for Employees

In line with the modern tendency in manufacturing establishments, to provide every possible convenience and comfort for employees, the Robbins & Myers Company has recently completed a garage to house the cars of the employees at its large motor and dynamo factory, Springfield, Ohio.

The building is of brick and steel construction. The brick is stuccoed, giving a very attractive appearance to the exterior of the building. The floor and also a large driveway extending the entire length of the front of the building are concreted. Daylight illumination is obtained both from windows in the side walls and from skylights. Night illumination is obtained by high-wattage Mazda lamps with metal reflectors.

The building is 84 by 64 feet and will house between 30 and 40 cars around the walls without using any of the space at the center of the floor, enabling every car to run in or out without moving any other car. The floor is marked off and each employee who drives a car has been assigned a position which belongs to him permanently, thus avoiding any confusion among the drivers as they enter.

English Electric Vehicle Committee Meet

A meeting of the English Electric Vehicle committee was held in London under the chairmanship of R. A. Chattock, October 1, 1915.

V. Mason took his seat on the committee as the representative of the Light Railways & Tramways Association.

The committee had submitted for its inspection, by the Krieger Electric Carriage Syndicate, Ltd., the first of the new "Ward" light delivery trucks to arrive in England.

It was reported that the sales of No. 4 issue of *The Electric Vehicle* had been very satisfactory.

As to further publicity work, it was decided that no more could be done at the present time than to concentrate in the committee's official organ.

The further standardization of details in connection with lead plate batteries was discussed and the committee will now await the decision of the Accumulator Makers' section of the B. E. A. M. A. upon their proposals.

Comparative Costs of Coal Delivery

Comparative costs of coal delivery by electric and gasoline trucks and by horse-drawn wagons at Hartford, Conn., are shown in the accompanying table prepared by the Hartford Electric Company.

pared by the Hartford Electric Company			
Type of Vehicle	Miles	Cost Delivered	Cost per Ton-Mile, Cents
One-horse (chute) wagon....	339.0	398.0	44.9
One-horse (bag) wagon....	398.0	326.9	51.5
Two-ton gasoline truck....	897.0	270.8	96.5
Two-ton electric truck....	961.0	415.1	66.2
Five-ton gasoline truck....	553.9	470.0	62.2

The 2-ton electric truck covered more miles and delivered more coal than either the 2-ton gasoline or the 5-ton gasoline truck. W. M. Thayer of the Hartford Company recently announced that under the battery-service system at Hartford trucks have now run 1,500,000 miles. A reduction in the rates charged was effected last July.

Electric Tractor in Street-Cleaning Service

The flushing and washing of streets is now being done electrically in Baltimore. During the summer the city used a 2-ton electric tractor for pulling a street-washing machine. In the winter the tractor will be attached to a snow scraper or ash cart. The tractor is of the General Motors Company's manufacture and was purchased in June through the Consolidated Gas, Electric Light & Power Company of Baltimore. It is equipped with a 300 amp.-hr. sixty-cell Edison battery. The cost for energy consumed is about \$40 per month. Outside of this charge and the cost of garaging there have been no other expenses during the five months the tractor has been in service.

Merely Filling the Job

The man who merely fills his job is not a paying proposition for any concern. That men are investments, no one will question, and like anything else, the investment may prove to be good or bad. Every live, up-to-the-minute company is always in the market for men with energy, ability and a healthy determination to make their jobs something more than a means for filling in the time between paydays.

"A man is known by the company he keeps," says the old adage. Modernized, it reads, "A business is known by the men it keeps." The man who has only enough interest in his work to hold his job, who regards his work simply as a day-to-day meal ticket, will be thrown out of work in a dull season, just as a machine is shut down when the demand for its product stops. But if the man is keen enough to visualize the future and has the ability to materialize his vision, the emergency but serves to bring out his true capabilities, and raise him a little higher in the organization. There are any number of men who can fill your job—perhaps better than you are filling it. The job isn't yours—all you have is the first chance to make good in it.

Some salesmen—so-called—can canvass a list of prospects all day, and figure the day's work done when the list runs out. But their minds are not so much on the work in hand as on the expense account, or the semi-monthly pay check. They don't think in terms of orders, but of calls.

Other salesmen—real ones—are never satisfied to work from a list. They call upon their resources and initiative to open up new lines of endeavor. A real salesman is all the time discovering new people to whom he can sell electric cars and extend the business. No job is too big for such a man. He will take a perfectly good job, one that men before him have been thoroughly content with, and before you know it, he's stretched it all out of shape in an attempt to make the job big enough to hold him.

It's just as easy to be a "job stretcher" as a "job filler," once you decide that you will be. Successful salesmen are not born—they are the result of energy, determination, and ability to persevere. There's no mystery about success; it's as certain to follow ambition, study and conscientious effort as the harvest is certain to follow sowing and rainfall.

But it takes an unqualified kind of everlasting hustle every time and all the time to increase and to garner that harvest. Success takes hustle when your brain and muscles flag and cry out for rest—but what is there worth having that doesn't come through painful effort?

Secretary's Annual Report

Presented at the Sixth Annual Convention of the Electric Vehicle Association

EVEN in the face of depressing conditions, the Electric Vehicle Association of America has made most meritorious progress the past year. The general office of the association, now about one and one-half years old, has succeeded in systematizing the work of the association and generally organizing the electric vehicle industry to the point where we are in a position to effectively carry out very comprehensive, practical promotion work of sales character.

Following in the report, we cite some of the more important features and accomplishments of the general office and we would be very happy to treat with any of these or other phases of the association's work in greater detail, if so desired.

COUNCIL MEETINGS.

During the fiscal year, five meetings of the council have been held in New York headquarters, as follows: November 16, 1914; January 15, 1915; February 15, 1915; June 25, 1915; September 23, 1915.

These meetings have had an average attendance of fourteen. Many of those attending have come long distances, and it has been with considerable expense of time and money that the officers and directors and guests have thus very materially aided the association in its promotion work, with its beneficial influence on the industry; and it has been the confidence entrusted, and general co-operation extended by the officers and directors, which has enabled the general office to make the progress effected, and this opportunity is taken to extend to the officers and directors the deep appreciation of the general office for their direction and courteous consideration which has resulted in the development of a valued *esprit de corps*.

MEMBERSHIP.

During the past year, conditions have been anything but favorable for a successful general membership campaign, but operating under this decided handicap, the association has made splendid progress in securing additional members.

During the year, about fifty members have resigned (most of whom have gone out of the industry); have either been dropped because they could not be located or because they were disinclined to discharge their indebted-

BY A. JACKSON MARSHALL

ness. A number of these deflections have been carried on the association's books for one, two or three or more years, so that their departure may be regarded somewhat in the nature of a house cleaning. The membership therefore suffers in this respect by a larger amount than during any previous year, and should consequently be considered in connection with the net increase of membership. The membership as of October 1, 1914, was as follows:

Active		Associate
C. S.	Mfrs.	
102	32	711

Auxiliary	Press	Total
10	30	885

On October 1, 1915, the membership of the association was as follows:

Active		Associate
C. S.	Mfrs.	
110	27	921

Auxiliary	Press	Total
13	30	1101

This indicates a net gain for the year of 215 members, and an increase of about 25 per cent. If we consider the 50 members previously referred to, we would have had a gain of 265 members, and an increase of about 30 per cent.

The figures largely speak for themselves and may be taken as rather conclusive evidence that the association is rapidly winning the respect and sup-

port of those who are or should be interested in our electric vehicle promotion work. The writer is of the belief that with improving business conditions and the much more extensive application of electric vehicles which now seems assured, and the co-operation of *all* interests, the association will very materially add to its membership and consequently extend its field of influence to the maximum extent.

MEMBERS IN THE UNITED STATES.

	Active		Associate	Auxiliary	Press	Total
	C. S.	Mfrs.				
Alabama	1	0	0	0	0	1
Arizona	1	0	0	0	0	1
Arkansas	0	0	0	0	0	0
California	6	0	79	0	1	86
Colorado	2	0	17	0	0	19
Connecticut	4	0	3	0	0	7
District of Columbia	1	0	51	0	0	52
Florida	1	0	1	0	0	2
Georgia	3	0	3	0	1	7
Idaho	0	0	0	0	0	0
Illinois	7	2	140	1	4	155

TREASURER'S REPORT	
Fiscal Year Ending September 30, 1915.	
Cash on hand September 30, 1914	\$1,990.42
Cash in office September 30, 1914 (not in treasurer's report)	75.00
October, 1914, salaries paid in September, 1914.	50.04

Total cash assets, September 30, 1914	\$2,115.46
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RECEIPTS	
Previous year's dues	\$ 130.00
Miscellaneous accounts, previous years	299.25
Current year's dues	6,200.34
Assessments	4,500.00
Advertising and membership campaign refunds	488.53
Prepaid accounts	160.50
Interest on bank balances	34.57
Miscellaneous receipts	942.68

Total receipts	\$12,755.87
	\$14,871.33

DISBURSEMENTS	
Accounts payable applicable to previous year	\$ 162.93
Accounts payable applicable to current year	13,958.71
	\$14,121.64

Cash on hand, September 30, 1915	\$ 749.69
Bank balance	\$944.21
Less outstanding checks	269.51
	\$674.70
Cash in office	75.00
	\$749.70

H. M. EDWARDS, Treasurer.

Indiana	1	1	0	0	0	2
Iowa	2	0	2	0	0	4
Kansas	1	0	0	0	0	1
Kentucky	2	0	1	0	0	3
Louisiana	1	0	0	0	0	1
Maine	1	0	0	0	0	1
Maryland	1	0	3	0	1	5
Massachusetts	23	2	75	1	0	101
Michigan	2	2	50	0	0	54
Minnesota	2	0	9	0	0	11
Mississippi	1	0	0	0	0	1
Missouri	4	1	41	0	1	47
Montana	0	0	0	0	0	0
Nebraska	2	0	1	0	0	3
Nevada	0	0	0	0	0	0
New Hampshire.....	0	0	0	0	0	0
New Jersey	1	3	43	0	0	47
New Mexico	0	0	0	0	0	0
New York	14	9	174	4	17	218
North Carolina	0	0	1	0	0	1
North Dakota	1	0	0	0	0	1
Ohio	3	3	51	5	0	62
Oklahoma	0	0	1	0	0	1
Oregon	1	0	16	0	0	17
Pennsylvania	3	4	103	2	2	114
Rhode Island.....	3	0	8	0	1	12
South Carolina.....	0	0	0	0	0	0
South Dakota.....	0	0	0	0	0	0
Tennessee	2	0	3	0	0	5
Texas	1	0	2	0	0	3
Utah	1	0	0	0	0	1
Vermont	1	0	0	0	0	1
Virginia	2	0	0	0	0	2
Washington	2	0	2	0	0	4
West Virginia.....	0	0	1	0	0	1
Wisconsin	3	0	2	0	0	5
Wyoming	0	0	0	0	0	0
Totals.....	106	27	884	13	29	1,059

MEMBERS NOT IN THE UNITED STATES.

	Active C. S. Mfrs.	Associate	Auxiliary	Press	Total
Australia	0	0	4	0	4
Brazil	0	0	1	0	1
British Columbia..	0	0	2	0	2
Canada	3	0	14	0	18
Denmark	0	0	1	0	1
England	0	0	9	0	9
Germany	0	0	1	0	1
New Zealand.....	0	0	3	0	3
Philippine Islands.	1	0	0	0	1
Scotland	0	0	1	0	1
South Africa	0	0	1	0	1
Totals.....	4	0	37	0	42

SECTIONS.

One of the most important, if not the most important, phases of association activities is that of section development. In those sixteen cities in which the association has sections, will be found the greatest progress being made, although unfortunately, in many instances, the sections are not receiving the proper and merited support of many interests who logically should be the most vitally concerned. However, the intensely practical work being successfully carried out by the sections is commanding increased respect, and it is felt that the wisdom of all-around genuine co-operation will shortly become generally apparent, with attending greater success to the entire industry.

Each of the sections of the association, now numbering sixteen, two of which (Kansas City and Portland) have been added the past year, are directed by a chairman, a vice-chairman, and a secretary-treasurer, acting in concert with the chairmen of the local committees, all of whom constitute the executive committee, which representing all interests, is in an unusually favorable position to conduct campaigns with the greatest likelihood of

success to all concerned. Usually the chairmen of local committees are members of corresponding national committees which makes for efficiency.

Sections offer a common ground on which *all* interests may congregate, and conduct their related activities with the greatest possible degree of success assured. The representatives of manufacturers, local electricity supply companies, garages, engineers, users, and others, through the medium of the sections are in a position to formulate and carry out equitable policies which insure just returns for energy, time and money expended. The principle involved being that due well-directed promotion efforts of all concerned, situations are created which permit of increased sales and just profit. If sales representatives are effecting profitable sales, and such is possible when *all* related interests band together for mutual co-operation, a healthful condition naturally follows. On the other hand, little is to be gained when the natural representative force is split up into groups, each nursing some fancied grievance. Destructive grouches and lack of confidence then prevails which cannot be satisfactorily overcome by any oral or written agreements or understandings, for the feeling of distrust will exist until more logical and helpful co-operation develops.

It is essential that the local sales representatives of *all* electric vehicle interests realize that the great gasoline car competition can only be successfully met by organizing every possible influence within the electric vehicle industry; that the representatives should get together and adjust any differences, if they exist, and realize the tremendous force which can be exerted by logical co-ordination of efforts. In this connection, it is well to understand that the electrical industry in general is probably the best organized commercial group in existence; that great success has been attained in all its branches with the possible exception of the electric vehicle. Why? Because the right sort of co-operation has not existed.

It is high time that this fact was generally realized, and a concerted effort made to obtain the recognition which the electric vehicle merits. Instead of any one person or concern holding back to see what others will do, unbelievable progress could be made if every interest would take the initiative and set the right example by becoming an active member of the association, especially in its sectional activities, where plans may be devised and put into effect to secure results generally desired.

Co-operation of the local interests, through the medium of sections, enables the development of very much needed charging stations at desired points which has proven of considerable value in successfully meeting stiff competition. Through the sections, it is possible to devise ways and means of catering to the comfort and convenience of electric vehicle users, in meeting local traffic requirements. That is to say, in many localities, the police have issued regulations restricting the time which unattended vehicles might remain stationary at the curb, which has caused great hardships on the part of electric vehicle owners who are economically operating their vehicles without the services of a chauffeur, notably as in the case of the Chicago section where arrangements have been made whereby electric vehicle users can leave their cars at prescribed points where they are received by uniformed messengers who take vehicles to allotted parking spaces, returning same at appointed times to the users, thus permitting thousands of users to enjoy the simplicity, convenience, economy, safety, and luxury of the electric in connection with their shopping, social and business duties. This extremely profitable service has been made possible

because of the right sort of co-operation between electric vehicle interests operating through a section of the association. There are many other important and needy developments, apparently difficult to attain, which could be realized with similar co-operation.

One important feature of electric vehicle sales work is that of local intensive publicity and advertising campaigns successfully being conducted under the auspices of the association's sections. It has been no uncommon occurrence—in fact, quite the reverse—to observe in the local newspapers, small, isolated electric vehicle advertisements, literally buried in a mass of gas car ads, struggling for identity and existence, and the readers of the press are likely to appraise the relative merits of the two types in the ratio of their representation, which operates against the best interests of the electric vehicle.

This unfavorable comparison is evidenced in another direction: Where a prospective purchaser of a motor car is discovered, probably fifteen or twenty representatives of gasoline cars lay siege, and the electric vehicle may be represented by one, two, or three salesmen, or none at all, the prospect being lead to underestimate the true value of the "electric" for his application. Some rather large motor car buyers have even been found who had no knowledge that the electric vehicle was a practical reality. This extremely undesirable condition has been greatly improved through the existence of local sections, because in those localities, there is sufficient promotion work to justify manufacturers opening branches, having representatives or agents, which materially strengthens electric vehicle representation, with its attending sales influence.

In many instances, sections have developed co-operative advertising campaigns. These usually take one of two forms. First, a number of dealers will get together and use a composite advertisement to which they subscribe and sign, such advertisements being usually about one-half page in size. The other form of co-operative advertising, which, in the writer's personal opinion, is the most effective, is for all local representatives of vehicles, batteries, tires, charging apparatus, central stations, etc., each to take an individual advertisement, and these advertisements to be effectively grouped on two adjacent pages, which would also carry some interesting electric vehicle news items. A double page spread of this character presents a solid front which immediately demands respect and consideration on the part of the purchasing public. It creates the impression that each of the advertisers is a separate and distinct strong organization and that these business institutions are not compelled to band together for support, as in the case of the composite advertisement, which usually is taken as a sign of weakness. Many of the association's sections are regularly getting out these double-page advertising spreads, which are very materially aiding local sales, and causing the representatives themselves to have greater pride for and belief in the commodities which they are selling.

In addition to the section advertising campaigns, there is also the very important publicity work which they are furthering. A number of the sections have among their members, representatives of the local press, who attend their regular meetings and who act as intermediaries between electric vehicle interests and the press. Such friendly and profitable relations insure a goodly amount of press notices which helps to relieve the preponderance of gasoline car notes.

The general office of the association, which is conducting a very elaborate publicity campaign which will be treated with in greater detail in the latter part of this re-

port, supplies all the section secretaries with the articles which it develops so that the local newspapers, not in direct communication with the general office, can be approached with regards publishing the interesting and informative articles developed by the association several times each month.

Considerable space has been taken to refer to some of the principal work of the sections because in the opinion of the writer, the extensive application of sectional development work assures us a great and powerful organization which has already become the envy of the gasoline car industry, and which will enable the electric vehicle to that much more rapidly receive the recognition which it merits. The work of our sections is far from being purely academic—it is entirely practical, with distinct sales characteristics.

MEMBERSHIP REPORT BY SECTIONS.

	Active C.S. Mfrs.		Asso.	Aux.	Press.	Tot.
New England Section.....	32	2	89	1	1	125
Chicago Section	5	2	138	1	5	151
Philadelphia Section	2	3	71	2	1	79
Washington Section	1	0	52	0	0	53
Cincinnati Section	2	0	18	0	0	20
San Francisco Section.....	1	0	20	0	1	22
Los Angeles Section.....	5	0	59	0	0	64
Pittsburgh Section	1	1	32	0	1	35
New York Section.....	8	9	198	4	17	236
Detroit Section	2	2	46	0	0	50
Cleveland Section	0	3	27	1	0	31
Toronto Section	2	0	14	0	1	17
Denver Section	1	0	17	0	0	18
St. Louis Section.....	1	1	26	0	1	29
Kansas City Section.....	1	0	15	0	0	16
Portland Section	1	0	16	0	0	17
Members at Large (Abroad)..	2	0	23	0	0	25
Members at Large (At Home)	44	4	59	4	2	113
Totals.....	110	27	921	13	30	1,101

FINANCES.

The finances of the association are thoroughly covered in the report of the treasurer. It might be interesting to note that all of the accounting and incidental detail has been handled by the general office under the extremely able leadership of our treasurer who has evolved and put into effect methods of accounting which have very greatly simplified this phase of the association's work.

There is a vast amount of detail associated with handling the various accounts of the association, and the work would be considerably lessened if all members would co-operate by discharging their indebtedness with the receipt of the first few statements of their accounts.

TRANSACTIONS.

As has been customary with the association since its inception, *The Central Station*, as published by H. C. Cushing, Jr., has been its official organ and has carried each month the report of association's activities as developed by the secretary, and other interesting related matter.

During the past year, the council, acting upon the recommendations of the official organ and transactions committee, has decided that after October 1, 1915, the association shall publish its own house organ, under some appropriate title in quarterly form. The details of this development will be more specifically set forth by the official organ and transactions committee.

Your secretary takes this opportunity to indicate his appreciation for the prompt and valued co-operation, so heartily extended at all times by Mr. Cushing, who has been no small factor in the association's success.

COMMITTEES.

Follows a list of the association's standing and special committees:

Central station co-operation; Constitutional revision; Finance; Garage and rates; Insurance; Legislation; Membership; Motion picture film; Official organ and transactions; Operating records; Parcel post delivery; Publicity and advertising; Revision of dues; Standardization; Traffic.

These committees have effectively conducted their work the past year, and their activities are set forth in detail by their individual reports to the convention.

SALES PROSPECTS.

Although the association has done no advertising since prior to January 1, 1914, we still continue to receive a number of inquiries from prospective electric vehicle purchasers. Many inquiries received are traceable to the very extensive publicity campaign being conducted by the general office in the United States as well as practically all foreign countries. It is interesting to note that we are constantly in receipt of valuable inquiries from Norway, Brazil, India, Africa, Holland, Austria, Cuba, Scotland, Italy, Australia, British Columbia, Nova Scotia, China, Russia etc., etc.

All prospects received are segregated into common and preferred. Common prospects are those that apparently are only generally interested as for instance, "Please send me booklet," etc. In reporting the common prospects, the name and address, together with any other information that is available, are indicated. Preferred prospects are those that offer something tangible to work on and in reporting these prospects, every scrap of information of value to the salesman is collected and issued. The prospects are further divided into passenger and commercial classifications and are mailed with all possible despatch to all member manufacturers of electric vehicles, batteries, charging apparatus, tires, etc., who might in any way be interested.

The prospects issued by this office do not only cover the sales of various electric vehicles and accessories but also in a number of instances refer to the matter of agencies, enabling the manufacturers to establish profitable sales outlets.

CONDITIONS ABROAD.

It might be interesting at this point, while we have the foreign activities of the association in mind, to refer to the fact that our relations with a number of foreign markets have very considerably increased the past year, and that while the name of the association would indicate that our efforts are solely of a domestic nature, yet our work carries us into many of the foreign countries. Largely through an extensive publicity campaign, made possible by articles prepared and released by the general office, we have been able to cause a considerable increased appreciation for electric vehicles abroad, and we are conducting an extensive correspondence with many governments, municipalities, concerns, and individuals, leading to the sale of "Made in America" electric vehicles and accessories in the foreign markets. Committees and commissions are already active abroad and in this country, looking toward the constructive period which will follow the existing destructive war, and we have reason to believe that their recommendations will include suggestions favorable to electric vehicle application on extensive scales. * * *

GUIDE ON SECTION MANAGEMENT.

The very comprehensive guide on section manage-

ment, prepared last year by the general office, intended to serve as a guide for the sections' executive committees in logically promoting co-operation, co-ordination, and efficiency in the work of the sections, has proven its value. The guide is now being carefully gone over and a second edition, embodying a number of changes, will shortly be issued.

ADVERTISING LITERATURE.

Last year, the association inaugurated the policy of developing advertising booklets, pamphlets, etc., for sale to central stations, manufacturers, representatives, etc., at a nominal cost. The success of this development prompted us, this year, to get out a series of pamphlets, entitled, "Features of the Electric," being a series of advertising brochures, setting forth features in which the electric excels other conveyances of travel, for distribution by central stations and others, to the layman, who needs the "electric," but is unaware of its adaptability to his requirements.

These six folders have been prepared with great care by the association for the purpose of extending a broader knowledge of the attractive features of the electric passenger vehicle. They are intended for use with regular mailings to a selected list in each territory. They carry six selling features, each in a separate folder, acting as a follow-up to the preceding number; their object is to create interest and confidence in the "electric" among physicians, salesmen, architects, clergymen, etc., and private owners, and to point the way for some detailed literature and sales forces of manufacturers.

It is the idea to prepare somewhat similar pamphlets, descriptive of various applications of the electric commercial vehicle, the extensive distribution of which, it is felt, would materially facilitate sales. The general office is at all times desirous of co-operating with the manufacturers or central stations or others in any co-operative development of this nature, and suggestions are courted and thankfully received.

"MEMBER E. V. A. A."

Last year, the suggestion was advanced that members of the association incorporate the phrase "Member Electric Vehicle Association of America" in their advertising and on letter heads. While a number of companies and individuals thought well of the suggestion and in some cases put it into practice, yet the idea has not been extensively adopted. It would seem that as the association advances in its influence the members might find it profitable to so indicate their connection.

MEMBERSHIP PIN.

We have developed a very artistic emblem of the association done in blue enamel and gold, one-half inch in diameter in the form of a pin in place of the somewhat larger button previously sold by the general office. This new, attractive pin is available at 25 cents.

OFFICIAL GARAGE AND CHARGING STATION SIGNS.

There are now 52 signs employed on a rental basis of \$3 for single-faced panels (showing white lettering on blue enameled field),—\$5 for two panels (when placed back to back, double-faced sign effected), and \$2 for each additional single-faced panel, the first year. The total yearly rental charges for official signs the second and succeeding years is the sum of \$1, irrespective of the number of panels. The initial rental charge covers sign cost and incidentals to distribution, etc., while the future nominal charge takes care of accounting, supervision, etc., and permits the signs to remain the property of the association.

The garage and rates committee have some interesting suggestions to make in their convention report, regarding the new types of signs, and methods of distribution, the adoption of which it is felt will considerably stimulate our relations with electric garages and charging stations, materially assisting in attracting a large membership increase from these important quarters.

EMPLOYMENT BUREAU.

Last year, we inaugurated the employment bureau, which we have further developed the past year. We now have this work systematized and are in a position to serve employer and employees, both of whom are invited to take advantage of this service without charge.

DATA FILES.

For a long time, there has been a great and unsatisfied demand for electric vehicle data, which would be instantly available. Shortly after the organization of the general office, last year, we began to develop very comprehensive data files so that information on all related subjects would be available to our members, and also enable the office to use this valuable information as a basis of our extensive publicity work. Our files have rapidly grown until they are probably the most complete of their kind in existence and it is seldom that a request is made to us for data which we cannot in whole or in part supply. The information contained in these files are of very considerable value to salesmen who oft-times encounter a problem somewhat out of the ordinary and if they will make a practice of getting in touch with the general office, when such occasion arises, I am sure that in most instances, they will obtain the necessary information.

Unquestionably, many members of the association possess data of extreme value, the dissemination of which would materially assist electric vehicle promotion work. The general office respectfully requests all holders of such data to send copy of same for inclusion in the association's data files. * * *

ELECTRIC VEHICLE REGISTRATIONS.

Owing to the fact that most states do not separate vehicle registrations, it is almost impossible to secure accurate figures regarding electric vehicle registrations in this country. An effort has been made to secure the cooperation of the secretaries of the various states in recording electric and gasoline vehicles, also passenger and commercial cars separately, so that some satisfactory index to motor car application might be obtained. We have met with some success in these efforts and feel that if the members of the association will take the matter up with their individual states, it may be possible before long to have this desired information.

EXPORT REPORT FIGURES.

E. A. Brand, acting chief of bureau, Department of Commerce, Bureau of Foreign and Domestic Commerce, has agreed to give careful consideration to our suggestion in the matter of separate gasoline and electric vehicle values in this department's statements of export.

CENTRAL STATION USE OF ELECTRIC VEHICLES.

Very considerable effort has been made by the association to introduce the extensive application of electric vehicles to central station work. A number of central stations use electric vehicles exclusively while some central stations do not in any way use the electric, and many electricity supply companies use both electric and gasoline cars. The general office has compiled a list (copies upon request—omitted as a measure of brevity), which indi-

cates the character of conveyances employed by the central stations. These figures indicate that the electric vehicle has yet to be properly appreciated as a transportation medium by the central stations, who should be most vitally concerned in its promotion, by not only advocating its use but also setting the right example by using electrics wherever possible.

THE ELECTRIC VEHICLE AND THE CENTRAL STATION.

Extremely friendly and profitable relations continue to exist between the National Electric Light Association and our association. The two associations are constantly working on mutual problems and developments, and the writer feels that the National Electric Light Association have contributed in no small way to the success which we now enjoy.

At the time of the National Electric Light Association's thirty-eighth annual convention held in San Francisco June 7-10, President Gilchrist and your secretary prepared and presented a paper "The Electric Vehicle and the Central Station," being a general review of the subject as indicated by title. Copies of this paper have been mailed to the entire membership of the association and to the press. The office has been in receipt of a large number of letters, complimenting the association on this paper, many stating that the paper had gone far to secure desired results. This paper has been very extensively reproduced in domestic and foreign publications and we see evidences from day to day of its influence in many directions.

LECTURES ON ELECTRIC VEHICLES.

There is now being developed a big, popular, interesting lecture on electric vehicles, with particular reference to their application to central station requirements, which lecture is largely based on the paper, "The Electric Vehicle and the Central Station" previously alluded to. This lecture will probably be given before many central stations, under the auspices of the National Electric Light Association, the coming year, and it is expected will do much to insure the electric vehicle proper recognition.

EXTENSIVE TRIP BY THE SECRETARY.

At the time that the president and the writer presented "The Electric Vehicle and the Central Station," before the National Electric Light Association convention, the secretary visited the following cities in the order named: Columbus, Cincinnati, Louisville, St. Louis, Kansas City, Omaha, Denver, Salt Lake City, Los Angeles, San Diego, San Francisco, Portland, Seattle, Spokane, Minneapolis, Chicago, in an effort to stimulate electric vehicle development. On this trip of some 8,000 miles, opportunities were had of studying, at first hand, conditions as they actually exist, and the secretary was able to obtain a line on the situation generally, which has proven of very considerable value.

Incidentally, an opportunity was offered to become acquainted with members and prospective members of the association, and to impart to them a very much better idea of the extent of the association's propaganda, which induced increased respect and admiration which has been reflected by greater enthusiasm from many quarters since the completion of the trip. On this trip, the secretary was able, with the very valued assistance of local representatives and others, to secure petitions for two new sections, namely, Kansas City, Missouri, and Portland, Oregon. It is felt that the secretary could, with considerable profit, make similar trips, especially to those parts of the country not yet visited, the coming year.

ELECTRIC PROSPERITY WEEK.

The general office enjoys the friendliest relations with the Society for Electrical Development with which it is co-operating to the limit of its ability in helping to make successful the society's plans for Electrical Prosperity Week, during which time, it is expected that there will be held in many cities, especially where the association has sections, electric vehicle parades and sociality runs. Considerable literature has already been developed in connection with these parades and runs, and it is to be hoped that the association will take full advantage of the unusual opportunity offered to secure for electric vehicles a very great amount of valuable publicity.

ELECTRIC VEHICLE CHARGING RATES.

For the general use of the National Electric Light Association, the Society for Electrical Development, and the Electric Vehicle Association, the society has issued a letter signed by the three organizations in which was enclosed a blank rate card on which central stations were invited to indicate electricity rates for heating, cooking, and battery charging. The response has been very large and while this list will probably not be available in complete printed form, yet the general office will likely be in a position to supply any detailed information for members.

SOCIETY OF AUTOMOBILE ENGINEERS, ETC.

The Society of Automobile Engineers, which recently established headquarters in the Engineering Societies' Building, has executed valuable standardization work, the past year, on behalf of electric vehicles, and has otherwise heartily co-operated, paving the way for even closer relations, which will considerably aid the cause.

It is interesting to note that the Engineering Societies' Building, New York, is the headquarters of a number of national organizations, several of which are more or less concerned in electric vehicle promotion. Among these are the National Electric Light Association, the Society of Automobile Engineers, American Institute of Electrical Engineers, Association of Edison Illuminating Companies, the Municipal Engineers of the City of New York, Society for Electrical Development, New York Electrical Society, and the Electric Vehicle Association of America. Within a couple of blocks from our office are located the Automobile Chamber of Commerce, motors and accessories manufacturers, while other organizations are close by. So it will be seen that we have excellent facilities for prompt co-operation, which is frequently required.

ELECTRIC VEHICLES IN MOTION PICTURES.

Rarely, if ever, does one see electric vehicles in motion pictures, and the patrons of the "movies" are inclined to think of motor cars in gasoline terms, which makes it that much more difficult to sell electric vehicles. For some months the association has been working with motion picture producers in an effort to have electric vehicles introduced in the better productions, and we have succeeded in convincing some influential motion picture people of the peculiar adaptability of the electric vehicle to their work. It is our endeavor to make electric vehicles the vogue in motion picture productions, and it is felt that the time is not far distant when the electric vehicle will form a conspicuous and interesting part of many good productions.

We have also been issuing, as a part of our publicity campaign with the newspapers and magazines, and especially to those periodicals of interest to the motion picture operator and playgoers, numerous ex-

amples of costly accidents resulting from the use of gasoline cars in motion picture productions, and how electric vehicles, owing to their simplicity of operation and positiveness of control, could be used with considerable advantage. We have already secured a large amount of space in the press on this subject which has been very favorably commented on by those whom we are most desirous of reaching.

PUBLICITY.

In the secretary's report of last year, the statement was made that the general office had been successful in establishing very friendly relations with the press generally; that we had succeeded in having a large amount of interesting matter printed which we believed overcame destructive prejudice and misunderstanding, and that we were issuing about twice a week interesting articles and news items to about two hundred mediums, but that there still remained a great deal of work to be accomplished, and it was hoped that our facilities during the year (past) would be increased to take advantage of the great moulder of public opinion—publicity.

Our success in this development has been far beyond our fondest hopes. We did not get well under way in this publicity work until about January 1, 1915, but since that time, the articles which we have prepared and released have been reproduced for the most part verbatim and conspicuously displayed in the most influential and conservative newspapers, electrical, automobile, trade, social, and popular magazines in this country and abroad. We estimate that from the first of January the articles which we have prepared and released have been given publicity to the extent of upwards of \$35,000 value, this sum being arrived at by figuring the space secured on an advertising rate basis, although it is generally conceded that our interesting and informative articles are of greater value than an equal amount of display advertising.

We enjoy the confidence and respect of the most influential mediums, many of which are for the most part receiving little or no advertising support from any electric vehicle interests, making the publicity accomplishments of the association all the more remarkable.

It might be pointed out that our articles have struck somewhat of a new chord in automobile publicity, they being written usually for the layman, and contain a wealth of real data with the customary trade platitudes and other irrelevant expressions reduced to the minimum, and consequently they stand out in sharp and favorable contrast to the usual publicity of a distinct trade and personal nature of questionable sales value.

Our facilities for developing these articles are improving every day and our relations with the press, both domestic and foreign, are rapidly advancing and becoming the more friendly, so that we may expect that articles of our development will be all the more evident next year, especially as new and interesting data is constantly becoming available.

GENERAL.

In conclusion, let me say we are well organized to take the leadership in extensive promotion work, having, as its object, the sale and use of electric vehicles. The general office is practically being conducted along the lines of successful sales organizations, and we respectfully urge all manufacturers, central

stations, and others interested, to call upon us for any constructive assistance which we are in a position to generously extend.

Unquestionably, the electric vehicle is destined to be the ultimate type of motor vehicle and in order to insure such supremacy without unnecessary delay, it is essential that all related interests recognize in the Electric Vehicle Association of America, the medium for exploiting this development, and actively participate in our work.

Finally, in closing, the writer desires to acknowledge his indebtedness to the four very capable and loyal young lady office assistants whose enthusiastic co-operation have made the accomplishments of the past year possible.

Brewers and Bottlers Using Electrics

The brewing industry has made a large expenditure for electric commercial vehicles and the success with which these interests have been operating this type of machine can be taken as an indication of what may be expected from motor vehicles in other lines of business. One of the strongest boosts the electric ever received came, unsolicited, from Jean A. Blaise, superintendent of the transportation department of the Doelger Brewing Company, of New York City, at the recent convention of the Electric Vehicle Association of America. Among other things Mr. Blaise stated that 58 electric trucks were saving \$80,000 a year for his company. Two men, one at \$23 and one at \$14 per week, are required to look after the electrics. This company has disposed of its entire stable of 200 horses, and in so doing twenty-eight city lots, valued at \$20,000 each, or a total of \$560,000, have been released, as the horse stable, which was 350 by 350 has been replaced with an electric garage, 85 by 100 feet, and the ground formerly occupied by the horse stable will be utilized for buildings in which beer will be bottled. The delivery of beer formerly cost this firm 35 cents per barrel, but with the electrics this has been reduced so that within the eight-mile radius the cost of delivering amounts to 15 cents per barrel. It is expected that as soon as additional trucks are installed—eight of which have been ordered—there will be a further reduction made. It is also presumed that beer will be delivered with the aid of more trucks at a cost of 12.5 cents per barrel, and this company expects to pay for its complete change to electrics in three years with the saving effected. After that time it can be seen that the saving will become more in the form of an earning.

Another instance of where real economy has been effected by the use of electric trucks by the brewing trade is found in the experience of the Jacob Ruppert Company, also of New York, which has 83, purchased at intervals covering about seven years. A saving of \$833.33 per machine per year is now being realized by this company. Out of 120 powerful horses, valued at \$1,500 and \$2,000 per team, only 50 remain in service, and in the meantime business has increased constantly. The cost of delivering beer, when the company was using 120 horses was 33.7 cents per barrel. With electrics it has been 24.75 cents per barrel, a reduction of approximately nine cents on each one. Although the horse equipment hauled about the same load as the electric—11,000 pounds—the distance traveled by each kind of equipment shows a wide variation. Horses accomplish only 12 miles a day, as against a

rated battery mileage of 35 for a five-ton machine and a speed of seven miles an hour, practically twice as fast as the horses were able to go.

As in the case of the Doelger company, the Ruppert interests have trained their horse drivers to operate the electrics, but this is not a new departure from the general practice, as statistics reveal the fact that ex-teamsters are now driving electric machines for various firms in all sections of the country.

These are just two of the many examples that could be cited to show the advantages of electric trucks for brewery delivery. The fact that the electric is being extensively used by brewers in many of the larger cities of the country, and is at least being introduced in most of the smaller cities, is known to most people who are at all interested in transportation. It is said that within a very few years fully two-thirds of all city trucking will be taken care of by the electric.

General Vehicle Company Merges with Peerless

Six million dollars will come to Cleveland owners of stock in the Peerless Motor Car Company as the result of a deal for the sale of the property and its merger with big eastern interests.

Consummation of negotiations, which had been hanging fire more than a month, brings into being the Peerless Truck & Motor Corporation, which was organized by J. P. Morgan, General Electric and other big interests, to acquire the properties and business not only of the Peerless Motor Car Co., of Cleveland, but also of the General Vehicle Co., of Long Island City, N. Y.

The authorized capital of the new corporation is \$20,000,000, divided into 400,000 shares of \$50 each. Two hundred thousand shares of stock will be issued now and the balance reserved for conversion and future capital purposes. It was announced that \$5,000,000 6 per cent 10-year gold notes convertible into stock at par after one year will be issued.

Owners of Peerless stock will reap a rich harvest, for the syndicate will pay them \$225 a share for common stock, \$175 of it in cash and \$50 in the gold notes. For their preferred stock they will receive \$105 cash.

The new corporation will manufacture trucks, aeroplane motors, gasoline and electric automobiles and ammunition parts, much of it for export. Manufacturing facilities will be increased, it is said, but no announcement has been made of immediate plans for the Peerless plant at Quincy avenue and East 93rd street.

The General Vehicle Co., a part of the new merger, controls the exclusive rights for the U. S. for the aeroplane motors of the Daimler Motoren Gesellschaft of Stuttgart and Berlin.

Electric Vehicles Used for Pole-Line Work

In Long Island City, N. Y., and the surrounding territory the New York & Queens Electric Light & Power Company makes extensive use of its 4,000-lb. electric trucks in pole-line work. These trucks are not only used to transport wire, insulators, pole-line tools, etc., but also for the transportation of poles.

The cost of aluminum has advanced \$50 per car; approximately 300 pounds of castings, have increased 12 cents a pound; 110 pounds of sheet aluminum, 11 cents a pound.

Reports of the Sections

Presented at the Sixth Annual Convention of the Electric Vehicle Association of America

NEW ENGLAND SECTION

NEW ENGLAND section has not had a very active year as far as meetings are concerned. The first meeting was held on October 14, 1914, at which reports of officers were received and accepted and the following officers were elected:

L. D. Gibbs, chairman, Edison Electric Illuminating Co., Boston, Mass.; H. T. Sands, vice-chairman, Malden Electric Co., Boston, Mass.; L. L. Edgar, treasurer, Edison Electric Illuminating Co., Boston, Mass.; C. H. Miles, secretary, Edison Electric Illuminating Co., Boston, Mass.

The executive committee members are:

Day Baker, F. M. Kimball, J. L. Snow, S. F. Smith, E. S. Mansfield, F. J. Stone, C. A. White and F. H. Smith.

This was the regular annual meeting of the year and no papers were presented.

The next meeting was held at the Hotel Thorndike on December 9 in connection with the Electric Motor Car Club of Boston. A prominent speaker had been expected to speak on transportation subjects, but at the last moment was prevented on account of illness. A short entertainment was provided on the spur of the moment and only routine business was transacted.

A movement has been on foot for some time to consolidate the activities of the Electric Motor Car Club of Boston with those of the New England Section, and on May 20, 1915, a meeting was held with the idea of making this consolidation effective, and suitable resolutions were passed.

There have been no further meetings of the section this year, but now that all electric vehicle activities are centered in the section, we anticipate a busy and profitable future.

At present the section has 113 members. Its statistician reports that there are registered in New England at present 962 electric passenger vehicles and 505 trucks.

The section has published this year a very satisfactory list of charging stations covering New England. This list was printed by the courtesy of the B. F. Good-

ber 2, 1914, the following resolution was unanimously adopted:

"We should do more to develop electric vehicle business in New England.



Getting a Charge from an Outlying Power Station.

"We should do more to get the dealers and users together with the central station."

As a result of this feeling the present electric vehicle committee was appointed, and later, on January 13, 1915, met, organized, and planned its work.

In order that the various phases of the work might be covered in a more thorough manner, sub-committees were appointed to cover the following subjects:

(1) Annual report; (2) Garaging and charging; (3) Rates; (4) Closer relations between central stations and vehicle interests; (5) General service; (6) Sales development.

The committee realized that owing to the adverse influence of the European situation, this was an exceedingly bad year to inaugurate a new line of work, and it was also evident that we could not expect to accomplish very much during the first year, but it seemed wise to start along broad lines so that the work might be developed from year to year and in the end enviable results accomplished.

The sectional section, in a majority of cases, has been inclined to view the electric vehicle in a more or less hostile manner, and has shown a lack of interest in any investigation of its possibilities as a central station servant, as well as a central station business producer. It is the aim of this committee, and it should be the aim of such committees as may succeed it from year to year, to seek to gather information for the central station from the central station standpoint, and to only recommend the electric vehicle in its various uses in such cases as they may be convinced would be for the advantage of the average central station. Also to gather information along the lines of electric vehicle development, what is being done by it, its possibilities, limitations, and how it can, under certain conditions, become of increasing value to the central station in the reduction of transportation costs and the increase of revenue from the sale of current.



Convention Delegates Greeting the Cross Country Motorists.

rich Company and has been favored with a wide distribution.

At an executive committee meeting of the New England section of the N. E. L. A., held in Boston, Decem-

In this report your committee will attempt to describe briefly the activities which have been attempted since its appointment, some of the conditions and progress relative to the electric vehicle, and the lines along which future development should be directed.

In order to gather data regarding present customs in electrical vehicle charging, the following questions were sent out to 170 central stations in New England by the sub-committee on rates:

(1) What are your rates for electric vehicle charging, both public garages and private garages?

(2) What rates do public garages charge their customers, both transient and regular?

(3) Do you maintain a public garage or charging station? If so, what are the rates charged for various classes of service?

The inquiries were sent out as follows:

Maine	35
New Hampshire	32
Vermont	17
Massachusetts	48
Rhode Island	10
Connecticut	28
	<hr/>
	170

One hundred and four replies were received, as follows:

Maine	12
New Hampshire	24
Vermont	7
Massachusetts	37
Rhode Island	7
Connecticut	17
	<hr/>
	104

These 104 answers may be classified thus:

State	No information on any question	Company has no charging station	No charging in public garages	No special rates
Maine	8	10	10	7
New Hampshire ..	6	12	12	11
Vermont	2	6	5	3
Massachusetts ...	11	21	27	12
Rhode Island		5	3	1
Connecticut	3	12	14	4
	<hr/>	<hr/>	<hr/>	<hr/>
	30	66	71	38

The following information as to rates was received in these answers:

Question 1.—Rates for electric vehicle charging both public and private garages.

Private garages	
3 cents straight	3
(one has \$1.00 minimum).	
3½ cents (one has \$1.00 minimum).....	1
4 cents (one has \$1.00 minimum).....	4
4½ cents (one has \$1.00 minimum).....	2
4½ cents slide	1
5 cents straight	7
5 cents slide	3
6 cents straight	4
6 cents slide	1
6½ cents "	1
7 cents straight	1
7½ cents "	1
8 cents slide	1
10 cents straight	2
10 cents slide	6
12 cents "	1
12½ cents "	1
8 cents peak.4c off-peak	1
12 cents " 7c "	3
15 cents slide to 4c.....	1

Public garages
Public and Private rates are the same except in three instances where the public rates are:
6 cents straight

6 cents straight	1
6 cents slide.....	1
3 cents straight	1

Question 2.—What rates do public garages charge their customers, both transient and regular?

Nearly all companies give the impression that the public garages charge transient and regular customers the same rate.

50 cents flat	1
75 cents "	1
\$1.00 "	1
5 cents "	4
6 cents "	1
8 cents "	3
10 cents "	3
10 cents "	7
20 cents "	1
2 cents per amp. hr.	1
90 cents to \$1.80 min.	1

In two cases public garages charge respectively \$1.00 for transient and 50 cents for regular, and \$1.50 for transient, and \$35.00 per month for regular service.

Question 3.—Do you maintain a public garage or charging station? If so, what are the rates charged for various classes of service?

3½ cents flat.....	1
4 cents "	2
5 cents "	5
6 cents "	5
7 cents "	3
8 cents "	1
10 cents slide	1
50 cents — \$1.50.....	1
\$1.00 min.	1
5 cents peak to 3c off-peak...	2
\$8.00 month	1

It has been found during the last year that restrictions in regard to electric vehicle garages have been quite severe, and in Massachusetts especially the district police have made a ruling that no rectifiers could be installed in the garages housing gasoline cars unless the rectifiers were installed in absolutely fireproof compartments. This ruling would probably have prevented any further extension of charging stations in small gasoline garages, and would have undoubtedly forced the abandonment of some of those already installed. The sub-committee has, with the assistance of other interested organizations, secured permission to continue these rectifier installations, provided no sparking point is within 4 feet of the floor.

It has been the aim of the committee to secure uniform rates in all garages in the Boston section, with the hope that this might spread more and more until all of New England had become substantially uniform, the result being in the smaller section of a 5-cent per kilowatt-hour for regular customers in most of the garages. An attempt has been made to increase the number of charging stations at important points throughout New England, but up to date it has been found rather difficult to interest the smaller stations in Maine, New Hampshire and Vermont. The territory within a radius of 50 miles of Boston at present is fairly well covered, and there are sufficient charging stations to make the trip from Boston to New York perfectly feasible. In connection with other interests a list of charging stations for New England has been prepared, and was printed and published by the Goodrich Tire Company, to whom the committee extend their appreciation for the valuable work done.

The sub-committee on sales development has sent out a number of letters to the various central stations in New England, with the desire to furnish information and data in regard to the electric vehicles in use in various sections with the results obtained, and also a clipping from the *Central Station* of April, 1915, by Stephen G. Thompson, on the "Development of the Electric Vehicle Market Through the Power Solicitor." In addition, a circular has been sent out together with a curve, showing how, in a central station which has an electric vehicle

department and where considerable work has been expended in exploiting the electric vehicle, the increase of the electric vehicle in the first four years of its existence was somewhat greater than that experienced by the ordinary power business in the same period.

The sub-committee on closer relations between the central station and vehicle interests submitted a report covering work and investigations, and as this is complete in itself it will be reproduced as submitted.

After careful consideration of this subject from many angles, it is the opinion of the sub-committee that the majority of the central stations in New England are prepared to actively support and give all reasonable assistance to any well considered and practicable campaign calculated to increase the interest in and use of electric vehicles in the cities and towns where they operate, provided such campaign is initiated by and conducted under the management of capable representatives of the electric vehicle interests.

It is also the opinion of the committee that the majority of central stations in New England are ready to provide charging facilities for electric vehicles whenever there is reasonable ground for believing that more than a sporadic demand for such service exists, or is soon to exist, in the territories covered by their lines.

It is believed that the present condition and probable future of the electric vehicle business does not justify the immediate formation of any special department, the employment of special help, or the expenditure of any material amount of money by the majority of stations in New England for the purpose of arousing interest in and pushing sales of electric vehicles.

It is apparent that the initiative in undertaking campaigns for the popularization and introduction of electric vehicles must come from the vehicle manufacturers or their selling agencies, and that such campaigns must be carefully and definitely laid out and actively and continually pushed, in order to bring satisfactory results. The vehicle manufacturers or their selling agencies must not expect to receive more than hearty co-operation on the part of central stations. The latter will almost universally be willing to supply all charging current necessary for making demonstrations, etc., free of cost, garage facilities without charge where such facilities belong to the central station or are available to it; a reasonable contribution to local advertising campaigns and the matching of the time of a competent local solicitor with the time of a competent vehicle salesman, when definite prospects are to be interviewed.

It is the opinion of the committee that there are a dozen or fifteen stations in New England which are doing unusually effective work in pushing the electric vehicle business, and that no more activity nor expenditure of money from these companies can reasonably be expected than is now being secured. The majority of central stations, however, are not in position to specialize on increasing this class of business without incurring expense greater in amount than they would be justified in undertaking. These companies, however, would all be willing to make contributions of the time and services of their employees and of reasonable sums of money for definite objects in connection with any thoroughgoing canvass of their respective local territories which they were assured would be effectually and consecutively carried out.

The committee is satisfied that the majority of central stations throughout New England are desirous and willing to make as favorable rates for current to be used in charging electric vehicles as are consistent with a modest profit above the actual cost of producing the current supply, and that the majority of stations do consider, adopt, and extend to bona fide users, minimum prices for charging current taken at proper hours of the day, and under conditions which will fit in with the general policy and practice of central stations in serving their customers.

Under the head of general service the committee has desired to make itself of use to central stations and vehicle interests wherever a question of service came up, and in this connection it has been arranged with the secretary of the New England section N. E. L. A. to keep a list of names of capable garage men, battery men, drivers, etc., as well as other statistics which may be received from time to time, and have these ready to distribute to the central stations as they may require. It is the desire of

the committee that any such information, either in the possession of central stations or vehicle interests should be sent to the secretary, and anyone desiring information regarding vehicles, or names of men to fill electric vehicle positions, should write to the secretary's office, 149 Tremont street, Boston, and the information will be looked up and forwarded.

Taking everything into consideration, the electric vehicle may be said to be in a healthy condition and gradually increasing in those localities where it has already made a start, but the incentive needed for a more rapid growth is the combined influence of the central stations united in the use and recommendation of this method of transportation. One of the latest encouraging features of the business is the installation of ten electric trucks in Boston for the collection and distribution of mail. This, it is hoped, will be the beginning of the use of electricies in the mail service not only in Boston but in other cities of the New England States. Electricies are increasing in various other branches of business, and with a return of better business conditions and easier finances, it is expected that the electric vehicle will begin to increase very rapidly.

The work of this committee should continue along the lines of service to the central station in the gathering of data and other information, and an effort to get the central stations of New England into a more receptive mood regarding electric vehicles than they have ever been before. It should be the duty of every central station to at least investigate and to have someone in their organization responsible for their electric vehicle attitude, even though they may decide in some cases that the conditions are not right, or the time not right, for actual work along these lines, but your committee feels that no central station is too small and no territory too hilly for the central station to at least find out what can be done, and what opportunities may offer for the adoption of the electric vehicle.

A word also should be said about the industrial electric truck, the use of which is increasing very rapidly in a good many of the cities and towns in New England, and where they are being used in factories and mills which are supplied by central stations the income to the central station is being proportionately increased.

The work cut out for a committee of this sort by the New England section has only just been started, and it is recommended that an electric vehicle committee be continued to carry on the work which has been started, and to complete the plans which have been made for the mutual benefit of the central station and the electric vehicle interests.

CHICAGO SECTION

In reviewing the work of the Chicago section for the past year, a sentence from a recent address of a railroad president is called to our mind: "Co-operation develops a winning way with the public—a way that wins confidence. When men act in concert, they operate on a higher plane than when they act as individuals." This is the spirit that has prevailed among the majority of the electric vehicle interests in Chicago for the most part of the past year. Everybody has co-operated and worked in harmony, so that we have been able to do things that count. Thirty-nine meetings have been held regularly every Tuesday noon, except during the summer months, with an average attendance of 24. The highest attendance at any one meeting was 45 and the lowest 7. From time to time this year these meetings have been attended by more different people representing more diversified lines than ever before.

The subjects presented at these meetings have brought forth much intelligent and helpful discussion, and several times it was necessary to close the meeting on account of the lateness of the hour and continue the subject the following week. We have always exercised the fullest freedom in discussing subjects of vital importance to the various interests in the industry, and as a result, have cleared up many wrong impressions about the other fellow's business.

The executive committee has met regularly every month and all the members have attended and contributed largely to the work. Eleven meetings were held with an average attendance of five.

The traffic regulation committee prepared a folder containing some suggestions about the road and telling about the E. V. A. A., entitled "Some Traffic Suggestions," which was printed by the section and distributed to the car owners. This committee also made an investigation of the lighting of the South Side boulevards, especially with respect to street car crossings, and made recommendations to the park commissioners for improvements. They also submitted to the street railway companies and the police traffic department suggestions for a more safe plan of starting up street cars, which have halted at boulevard crossings.

Our local standardization committee has had many meetings over a considerable period of time and has made some very exhaustive studies regarding battery equipment for electric vehicles. The report of this committee would do a great deal towards improving the electric vehicle industry if same were to be adopted by the national organization and put into practical use. This work consisted in determining the most economical number of cells per battery, as well as size of jars and arrangement in trays.

The orphans' day outing committee worked hard in co-operation with similar committees from other allied associations in raising funds and conducting the regular annual outing for 2,500 crippled and orphaned children and old ladies. The secretary acted as chairman of their passenger car committee and Homer E. Niesz is permanent treasurer.

Our membership committee has accomplished a great deal and besides procuring some 35 new members persuaded a number to remain who were inclined to drop from membership. During the year the total membership increased from 116 to 140.

The papers and program committee did some unusually hard work to provide topics and speakers for the weekly meetings. During the past year we were privileged to hear many interesting and instructive subjects such as the following:

- European Experience in Battery Maintenance Systems.
- Mechanical Rectifiers.
- Charging Apparatus for Private Garages.
- Best Ways and Means of Promoting Electric Passenger Cars.
- Best Ways and Means of Promoting Electric Commercial Cars.
- Constant Potential Charging Systems for Garages.
- Charging Electrics in Unattended Garages.
- Ampere Hour Meters for Vehicles and Garages.
- Methods and Costs of Commercial Electric Vehicle Operation.
- Construction and Operation of Edison Storage Batteries.
- Experiences Gained from Operating a Public Electric Garage.
- Experiences in Developing a Large Commercial Vehicle Delivery System.
- Co-operation between Dealers and Salesmen for the Betterment of the Business.

- Safety and the Automobile Driver.
- Electric Industrial Trucks.
- Electric Vehicle Delivery in Merchandising.
- Comparative Garaging Costs—Electric vs. Gasoline Passenger Cars.
- Organization, Journalism, and the Power Wagon.
- Charging Batteries from High Potential Circuits.
- Latest Developments in the Auto Tire Industry.

The garage committee reports that conditions are not as they should be in the passenger car field in Chicago and they believe that is one reason why commercial cars have not increased to a greater extent. They believe that a garage cannot possibly live and maintain itself unless it be allowed a sale of at least a portion of the supplies at a profit, in addition to the present scale of garage fees. The garages are merely asking for a little more general co-operation on the part of the vehicle manufacturers, and this committee is certain that the electric vehicle industry can never have deserved success unless some decided action ensues along this line. In other words, to ever hope to make this a great big industry, the necessity of good garages must be recognized.

At the annual meeting last October, we welcomed our esteemed member, John F. Gilchrist, as the newly elected president, and it has been our pleasure to have him present at a number of our meetings during the year. One especially interesting meeting was a joint session with the electric club—Jovian League, at which time President Gilchrist as speaker was able to present the merits of both the passenger and commercial electric vehicle to the entire electrical interests of Chicago. At this time also, the E. V. A. A. film, entitled "Selling Electric Vehicles," was shown.

On April 26 there was a Prosperity Day parade, which was the largest demonstration of the kind ever held in Chicago. We arranged for electric passenger cars to lead the automobile division and for electric trucks to lead the commercial car division. Considerable effort with creditable results was made by the officers in getting electric vehicles to participate.

Near the end of our active season last summer we had the pleasure of entertaining executive Secretary Marshall and hearing from him regarding the various sections of the E. V. A. A. as well as his ideas upon the present electric vehicle situation.

On July 29 the Chicago section joined with the Chicago Garage Owners' Association for the third time in an annual picnic and Feld Day at Cedar Lake, Ind. About 200 made the trip by automobile—one electric car making the 85-mile round trip in a slight excess running time over the gasoline cars. The E. V. A. A. baseball team was victorious over the C. G. O. A. team.

On account of the passing of a city ordinance, which prohibits unattended vehicles in the "Loop" district from standing over 30 minutes at a time in any one place, it became necessary to devise a remedy, as the ladies could no longer use electric cars for shopping. As a consequence, the electric car was falling into bad repute and began to lose in favor of other types of cars accompanied by chauffeurs, etc. One garage man started a free parking system for his patrons early in 1915, which consisted of a checking station, where cars may be left by patron, the car being taken over into the public parking space in Grant Park and returned when owner was ready to return home. As this has proven popular, and to make it more generally available, in connection with several garages on July 1, the Chicago section opened a downtown electric parking system with a checking station at the Electric Shop of the Commonwealth Edison Company at Jackson

and Michigan boulevards. The plan is to give this service only to owners of electric cars kept by garage men that are members of the E. V. A. A., and the costs are being met by the benefited garages and by the vehicle manufacturers. The first station proved useful and so satisfactory, that on August 1, a second station was opened with headquarters at Jevne & Co. at Michigan boulevard and Washington street. The service is operated only at owner's risk. At present the hours are from 8 A. M. to 6 P. M. on week days, and no attempt is made to drive cars to any other point than the two checking stations. One of the best possible effects of our co-operative parking system, and one which has already produced marked results, is the fact that we are causing the electric garagemen to see the many benefits to be derived by joining forces with the Electric Vehicle Association of America. Heretofore many of the local garage operators felt that this Association was no place for them, as it was largely dominated by manufacturers and others whose co-operation, from the viewpoint of garagemen, has more often been a "knock" instead of a "boost." We believe the establishment of the electric parking service is probably the most practical and lasting work the Chicago section ever accomplished.

There was recently formed in Chicago the Electric Garage and Dealers' Association for the purpose of fostering and enhancing the electric vehicle industry in all of its various branches. Our secretary-treasurer was elected secretary of this organization, so that his office will eventually work out as a sort of clearing house on all matters pertaining to the electric vehicle industry in Chicago. Our statistician reports 3,200 (estimated) passenger electric cars and 893 electric trucks now in use in Chicago and vicinity, an increase during the year of 200 electric passenger cars and 90 electric trucks.

Recent large reductions in the price of electric passenger cars, on the part of two manufacturers, with reductions sure to follow on the balance represented in Chicago, gives us good reason to believe that this branch of the industry at least is upon the threshold of a very active and prosperous year.

PHILADELPHIA SECTION.

Regular monthly meetings have been held since the convention last October, with a specially invited speaker for each occasion.

The October and November meetings were held in the evening, after which the meetings were converted to noon hour luncheon meetings, which proved quite successful.

The speakers, with the titles of their papers, were as follows:

Authentic Costs of Electric Vehicle Operation, by William P. Kennedy; Charging Apparatus for Private and Public Garages, by Maxwell R. Berry; Silvertown Cord Tires, by George O. Simpson; New and Improved Methods of Up-to-date Vehicle Lighting, by Frank B. Ruoff; Sensible Power Wagon Applications, by Stephen G. Thompson; Ball Bearings, by B. D. Gray; Advertising, by R. D. Snodgrass; Electric Truck Operation, by Walter Metz.

The several standing and special committees, which were appointed, have been active in the fulfillment of their duties. The work of the garage committee resulted in the publication of a large list of available charging stations, both inside and outside of the city of Philadelphia. This was accomplished by securing the consent of a number of private garage owners to publish their names as being willing to help a vehicle user in case of emergency.

We feel that we have had a very successful season and show a substantial increase in membership.

WASHINGTON SECTION.

The Washington section, having a membership of 38, has held, since October 1, 1914, seven technical meetings with an average attendance of 10 members and guests. Beginning with November, 1914, it was considered desirable to replace the lunch meetings with an informal party. Since that time we have had six parties with an average attendance of 30 members and guests.

We have been exceptionally successful in securing speakers to address the technical meetings. Having adopted the policy of having one talk on a subject of particular interest to the members of the association followed by an address, illustrated if possible, on some subject of more general interest, for these latter talks we have secured a number of experts from the different departments in the Government, such as the office of public roads.

A great deal of interest has been manifested both in the business meetings and the social gatherings. We have thus been able to secure a more intimate acquaintance between the various men interested in the electric vehicle and other allied industries. We have been quite successful in arousing interest among the users of cars, as well as among those interested in their sale, having several truck users who regularly attend our meetings.

In May the second annual sociability run was promoted. It was a marked success, having fifty entries. With one or two exceptions all of the cars entered actually participated in the run.

Through the work of the publicity committee, and the co-operation of the local newspapers, we have published a number of electric vehicle sections in the daily papers, in each instance two pages being devoted to electric vehicle matters, about half of the space being advertising and the balance news items. The section has also published several half-page co-operative advertisements in connection with the sociability run.

CINCINNATI SECTION.

The initiative toward organization of the Cincinnati section was taken by W. W. Freeman, president of the Union Gas & Electric Company, who on March 23, 1914, wired the board of directors of the association, then in session at New York, that the necessary 15 members could be secured to form a Cincinnati section, and asking that such a section be authorized at that meeting.

This application was acted upon promptly, and with favor, and the Cincinnati section became a reality. The first meeting was held in Mr. Freeman's office on April 22, at which time officers were elected, and an extended discussion took place on what should be done to further the electric vehicle industry in Cincinnati. This meeting proved the need of such an association in Cincinnati, where the various dealers could meet on common ground and adjust petty differences, as considerable ill feeling was evident, and the meeting broke up in more or less of a row.

The various electric car dealers did not seem to favor an organization of this kind, and it seemed almost impossible to get enough members together to justify holding regular meetings. During that administration practically nothing was accomplished, partly due to the fact that several officers removed to other cities, and business activities of the remainder prevented them giving the proper time to the promotion of the section's work.

(To be continued)

Chicago to Cleveland in an Electric Roadster

Chicago Electric Cabriolet Roadster Makes Successful Run Under Difficult Road Conditions

THE electric roadster has again made itself prominent in a cross country run from Chicago to Cleveland arriving at that city during the sixth annual convention of the Electric Vehicle Association of America, held October 18 and 19.

The decision to make this trip was made but a few days before it was necessary to start, and for that

this outfit was 15 amperes, and for that reason two hours were spent in looking up other accommodations, which resulted in finding a rectifier that could give a higher rate, viz., 28 amperes. This necessitated considerable delay and threw a side light on how little information some power companies have as to the charging facilities in their respective localities.

Between Laporte and South Bend extraordinarily bad roads were encountered. Owing to the main traveled road being closed for repairs a 15-mile detour was necessary, over which stretch of road the car was forced through the heaviest possible combination of sand, clay and water which was up to the hubs a good part of the distance. To show how little this road was used, but one solitary gas car was passed in the entire 15 miles, indicating that even the gas cars were avoiding its terrors. After this demonstration, no one can belittle or question the power and ability of the modern electric car.

At South Bend good charging facilities were available as there were several electric garages to select from, equipments, motor generator sets, capable of giving 100 amperes, or more, if necessary. The car remained here all night, and the following day passed through Elkhart, Goshen and Ligonier to Kendallville, Ind., 77 miles from South Bend. On this route charging facilities were located at Elkhart and Goshen. Ligonier had available a rectifier at its power station for public use. Kendallville boasted of but one electric car and the only charging facilities available was the rectifier which the owner of this car possessed.

Poor roads were encountered practically the entire distance to Kendallville; the last 20 miles to Kendall-

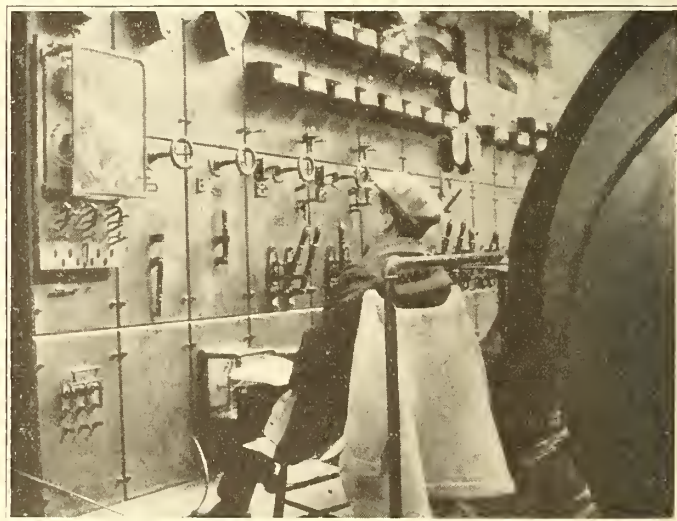


Just Before Departing for Cleveland

reason, the preliminary preparations were necessarily brief. However, the most direct route was selected which followed the Lincoln Highway, as far east as Ligonier, Ind., up to which point all charging stations were determined by the E. V. A. Lincoln Highway report. All power companies and charging stations were wired in advance, to assure that they would be ready to furnish the proper charging facilities. Replies were received from all points, to the effect that they could charge electric vehicles. In some cases it was necessary to send several messages before it was entirely clear to the power companies just what was required.

C. H. Kinney, superintendent of service, Walker Vehicle Company, Chicago, and W. J. Burns, of the Philadelphia Storage Battery Company, were selected to pilot the car. A stock model Chicago electric cabriolet roadster was used with standard equipment throughout, which included a 42-cell Philadelphia Diamond Grid battery and Firestone dual tread cushion tires. The solid tire equipment not only assured greatest mileage but immunity from tire troubles and delays. The car carried a message of greeting from the Chicago section of the Electric Vehicle Association to all central stations and electric garages on the route, as well as greetings to the sixth annual convention of the Electric Vehicle Association of America.

The car left Chicago Thursday morning, passing through Valparaiso and, barring several detours on account of road repairs, had good traveling to Laporte, which point was reached by noon, the odometer reading 81 miles. Laporte had previously assured that they could give a good boost during the noon hour from a private motor generator set. After arriving at Laporte it was found, however, that the maximum capacity of

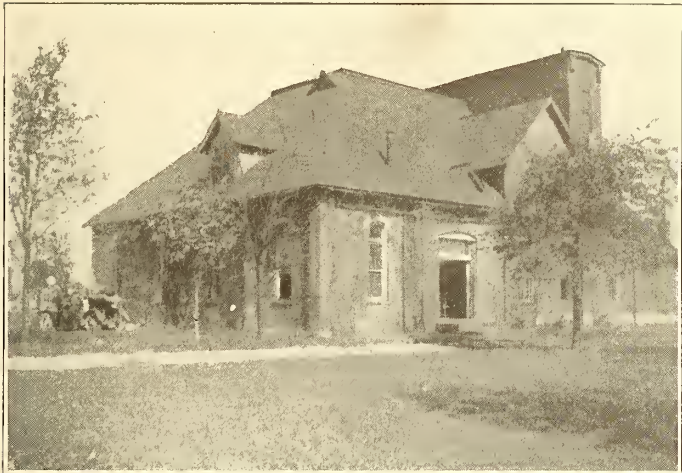


Mr. Kinney Watching the Charging Rate.

ville having many steep hills. The roads were made much heavier by recent heavy rains and fast time was out of the question.

The third day's run from Kendallville took the car through Bryan & Bowling Green to Fremont; all points in Ohio, a distance of 142 miles. At Bryan no regular charging facilities were available, but through

the courtesy of the municipal lighting plant a boost was taken from the exciter by cutting down the voltage on the generator—no rheostat required, the car being given a constant potential charge. At Bowling Green no regular charging facilities were found but a



Getting a Boost at Bryan, Ohio.

boost was secured from the Railway Power Company's exciter, the same as in Bryan. At Fremont no regular charging facilities were found, but a charge was received from the lighting company's power house, from the exciter, same as in Bowling Green. The car remained at Fremont over night. The great increase in mileage made the third day indicates clearly the improved conditions of the roads; in fact, as soon as the Ohio state line was crossed this improvement was very noticeable.

The last day's run from Fremont to Cleveland was made with ease, due to exceptionally good roads. Mileage covered was 94. At Elyria regular charging facilities were found at a public garage, the equip-



Making a Gravity Test.

ment, being a motor generator set with 40 amperes capacity.

Total running time for entire trip was $28\frac{1}{4}$ hours, covering a total distance of 424 miles. Approximately 50 miles of this distance taken up by detours.

This trip proved conclusively that the possibilities of the modern electric car are limited in no way, but

it was clearly shown that to make such a trip possible to any electric car owner, that improvements in charging facilities would be necessary. It can be said that the power stations and electric garages did everything possible to accommodate the car and put at its disposal such facilities as they had for charging.

Most of the roads made on this trip would act as a distinct barrier to travel of any nature, gas cars included, but it was evident that a great deal of the important repairing was under way on the main travel roads, which necessitated wide detours on roads less used and which accounts, in the main, for the deplorable traveling conditions encountered. After these road repairs are completed and the necessary improvements made in charging facilities at the different points, satisfactory electric travel is assured.

Through the good efforts of the Electric Vehicle Association of America the question of proper charging facilities, particularly along the Lincoln Highway, will be taken care of and it will then prove possible for electric cars of the proper construction, to have an unlimited radius to their field of action.

Better Material in Late Models

An interesting investigation was recently made by a prominent statistician with the point in view of determining the relative grade of materials used in different types of automobiles. In the general investigation it was shown that materials used in all automobiles of today have improved approximately 50 per cent over the materials used 10 years ago. When this fact is considered, it is easily understood why automobiles in general continue to stand up and do the hard work demanded of them so much better than was the case even five years ago.

In investigating materials used in the construction of electric cars, it was astonishing to find that in even the smallest and apparently most unimportant parts of the car, the very highest grades of materials were used. A careful investigation was made of metals, bearings, upholstery and other materials used in the construction of electric cars. It was found that the materials used in the popular electric were not excelled by any American or foreign made car, listing even at prices considerably lower.

Big Increase in the Use of Motor Driven Vehicles

Because almost every motor truck company in the United States has been running at full capacity for the past year and some have declined to give their output figures there has been little opportunity to make accurate estimates on the year's total output. The most authoritative estimate made is that 37,000 motor trucks were marketed during the preceding twelve months.

An indication of what the coming twelve months will see in the matter of motor truck production is given by a statement appearing in the current number of the *Internal Gear Drive News*. This statement is that three members of the association who manufacture motor truck axles will turn out during the coming year an excess of 15,000 axles. This number is based on contracts already in existence in which definite delivery dates are named and does not include contracts yet to be signed, nor the output of any companies that intend to manufacture their own axles.

Why The Electric Truck Finishes Strong

There is so much noise about automobiles in general that the Electric truck suffers to some extent just because it is an Electric—hence quiet and rather unostentatious. Electric delivery expands yearly on the solid economic basis which characterizes the growth of Electric lighting power, traction, etc. In comparison with its more spectacular co-worker, the gasoline truck, the Electric may seem to be slow and to “trail” its betters, but don’t forget the finish of the race.

The economic fields of the two types are rapidly becoming recognized. Firms who discarded the early Electrics for gasoline trucks are going back to the modern Electric which has all the economic advantages of a machine electrically propelled, plus far better batteries and other improvements. The great city fleets of our corporations are nearly all Electric and other city fleets soon will be.

The more scientific delivery becomes the more Electrics will be used. The Electric excels in three essentials—*long life* which means low depreciation—*dependability* which means fewer breakdowns and—*economy of operation* which means fewer parts replacements, lower wages for driver, low insurance rates and so on. These things the ledger shows in black and white (sometimes red also) and the firms who heed, credit the Electric at the tape.

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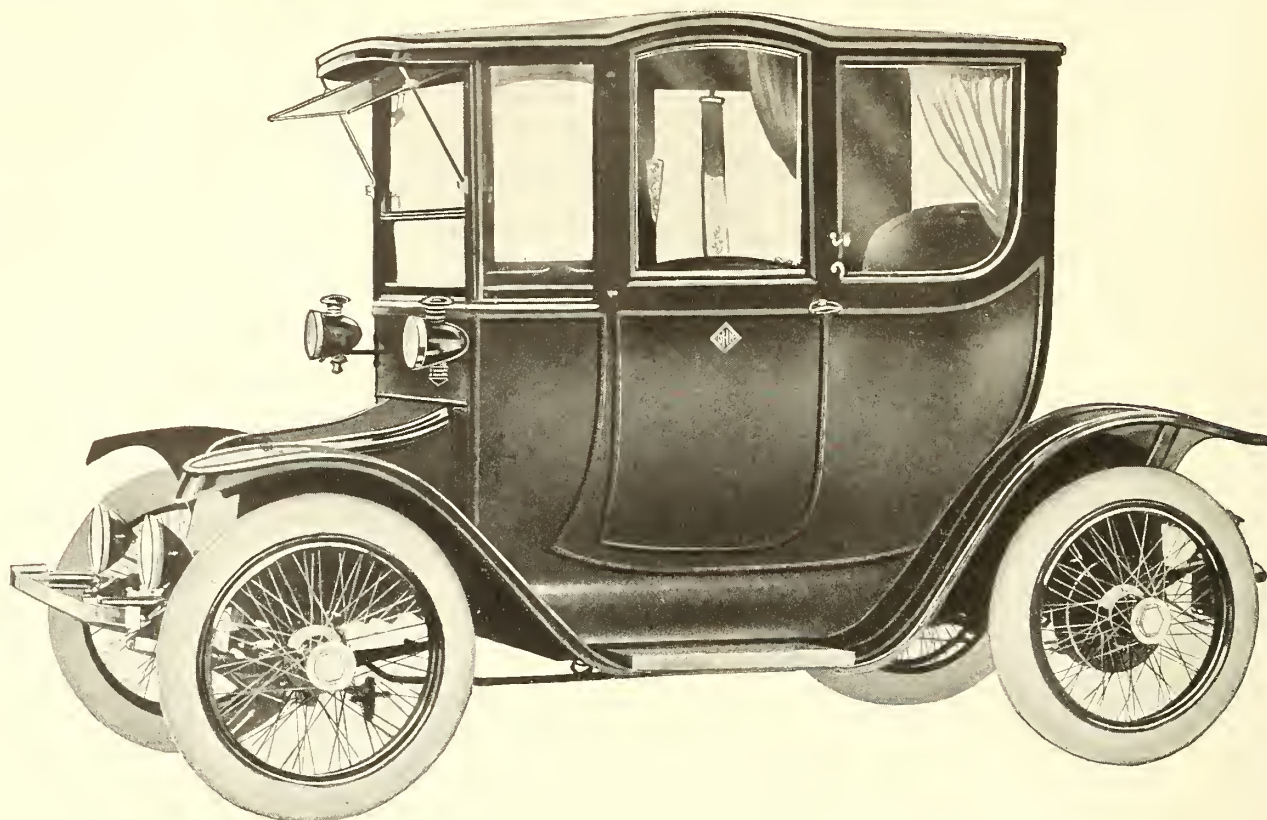
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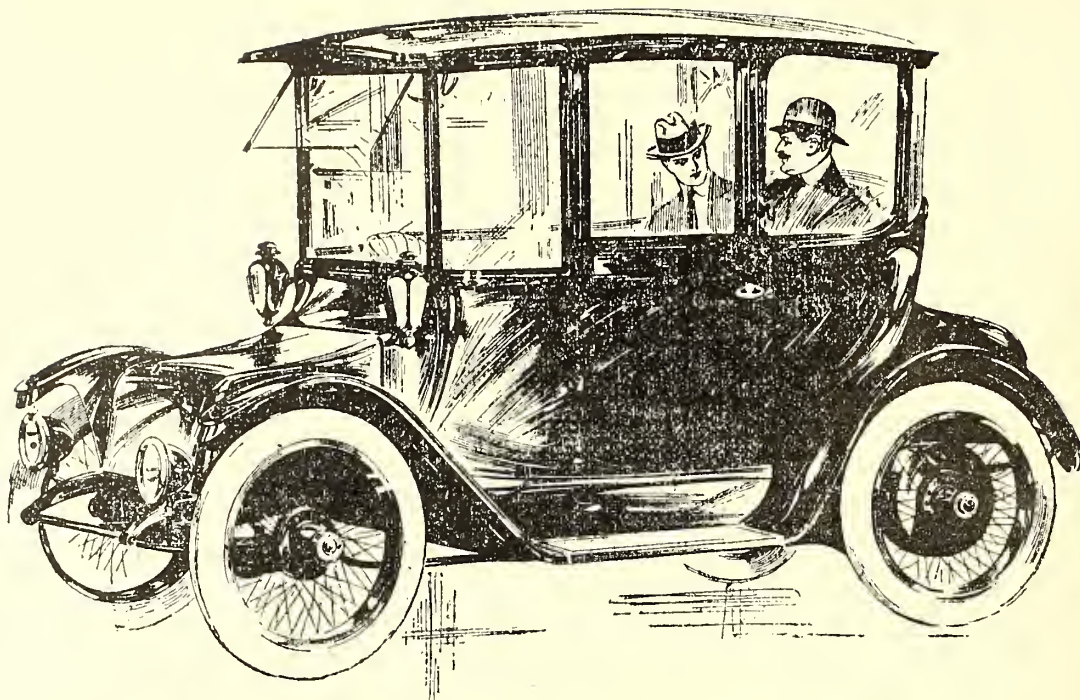
Vol. 7

CHICAGO, DECEMBER, 1915

No. 6



WAVERLEY FOUR-CHAIN BROUGHAM



Two in Every Three Buy a Detroit Electric

MORE than two-thirds of all present-day purchasers of electric cars now buy DETROIT ELECTRICS. This fact should win a moment of your consideration, for, if the verdict of buyers shows which car excels, then the DETROIT ELECTRIC must be given top place in the electric-car field.

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Volume VII

CHICAGO, DECEMBER, 1915

Number 6

Appalling Slaughter of Pedestrians

Reckless Driving of Complicated Motor Cars by Incompetents Causes Enormous Loss of Life

A RECENT editorial in the *New York Times* points out the appalling fact that 142 persons were killed by automobiles in New York City during the first nine months of this year. "The reports," states the *Times*, "of the National Highways Protective Society and the Legislation League for the conservation of human life, show a deplorable increase in the slaughter of human beings by recklessly propelled vehicles. Within the city limits in the month of October, forty-three persons were killed by automobiles, six by trolley cars and four by wagons. Manhattan shows the greatest increase in automobile accidents of this kind. If as many persons were killed in one month by one contagious disease, such as diphtheria or smallpox, the whole community would be aroused."

It is indeed high time that the public conscience was awakened to the wholesale slaughter that is going on in our streets as a result of incompetent or reckless persons driving a vehicle as difficult and complicated as the average gasoline automobile. When it is considered that it is possible for practically anyone who owns a car to drive it through any of our large city's congested streets, whether or not he is really qualified to do so, it is a great wonder that there are not many more accidents of this nature.

A steam engine is essentially an easier machine to handle than a gasoline automobile. The gas car not only has a complete gasoline plant, but also contains a complete electrical system, and as everyone knows gasoline automobiles are becoming more and more complicated every year. To revert to the steam engine, it is necessary for an engineer to serve several years of apprenticeship and pass the most stringent examinations before he can operate a locomotive. Who would ride in a train driven by an engineer without experience or knowledge of the mechanism of his engine? Yet, as we have said, a steam engine is more simple to operate than the modern gasoline car. An engine runs along rails, no guiding is necessary, the roadbed is guarded by signals and the engineer with the assistance of the fireman is always on the lookout for anything that might stray across the tracks. Commerce figures indicate that during the year 1914 on all the railroads of the country there were only 85 passengers killed in train accidents. The same year in New York and Chicago alone, 774 persons were killed by automobiles. It is interesting at this point to note that statistics indicate that the

number of accidents attributed to automobiles in New York and Chicago, when the populations of the two cities are considered, prove that the Chicago automobile or driver is about one-third more dangerous than in New York. When it is considered that the railroads of this country operate over one-quarter million miles of railway, or enough to encircle the earth ten times, and that they carried considerably over a billion passengers, about 150 times the combined population of New York and Chicago, we are forced to realize the careful legislation and the constant training and education of employes that is behind this efficient system. The writer holds no brief for any railroad nor does he mean to form a basis of exact comparison between the locomotive and the automobile. However, it is perfectly evident to anyone who looks into the matter that if the railroads of our country can operate on such a tremendous scale with the minimum of 85 fatalities for one year, it is time for the makers of automobile laws to center their attention on the source of so much havoc and human slaughter on the public highways. When the state grants licenses to high-powered gasoline motor cars which are distinctly of a type not built for racing purposes, capable of speeds, however, greatly in excess of rational or lawful limits, it is rather a nice question whether the states in licensing these excessive speed machines are not themselves liable for damages from indiscriminate driving.

As an example of the great amount of acceleration of which the modern gasoline car is capable in a very short distance and time, the following acceleration test was made with a 38-horsepower automobile weighing 4,063 pounds with passengers, maintaining an average speed of 61.12 miles per hour over a stretch of 13.8 miles, with these results:

Speed Attained.	Time in	Distance in
	Which Speed Was Attained from Rest.	Which Speed Was Attained from Rest.
10 miles per hour.....	1.5 seconds	4.8 yards
15 " " "	2.8 "	13.2 "
20 " " "	4.4 "	27.0 "
25 " " "	6.5 "	49.6 "
30 " " "	8.75 "	80.0 "
35 " " "	11.75 "	129.5 "

The average acceleration for 151.56 yards was 5.38 feet per second. Thus it will be appreciated that the car just referred to designed especially for touring purposes and equipped with a proper touring body is fully capable on level roads of varying in

*Secretary Electric Vehicle Association of America.

speed with an express train, and therefore a very dangerous toy to let loose on the public highways in the hands of a reckless driver.

Momentum increases as the square of velocity, and with the acceleration test given above before us, it is evident that a high speed applied to a heavy moving mass like a gasoline touring car or automobile truck puts it beyond a quick-stop control in traffic or emergency. The utmost that any brake can do, no matter how modern or complete it may be, is to lock the rear wheels of the truck. The distance the truck will then travel after the brakes have been applied depends on the weight of the vehicle and the speed. It is evident that a heavy truck racing at an excessive speed will slide a very great distance before coming to a standstill even after the brakes have been applied.

A horrible result of the excessive speeding of a heavy gasoline truck which is fresh in everyone's mind was the accident on November 13, in New York, in which a child was killed and two other persons probably fatally injured. The two-ton truck, which was speeding at a rate of thirty miles per hour, it is said, was incapable of being stopped in a sufficiently short time to avoid running down three people. Even after the brakes were applied, the big truck slid about the street, endangering scores of others and was brought to a standstill only after covering a considerable distance.

It was only after the invention of the powerful airbrake that the speed of the steam engine could be increased with safety to its present rate. Even with the prompt and positive control of this type of brake, it is not possible to bring a speeding train to a standstill within a distance considerably longer than the train itself. The results of the Pennsylvania Railway brake tests for 1913 will offer to the lay mind some conception of the tremendous momentum a heavy body acquires when moving at high speed. A train of twelve steel passenger cars and modern locomotive was used, weighing about 1,000 tons and being about 1,000 feet long. At a 60 miles per hour speed this train would have a kinetic energy of 224,000,000 foot-pounds. With ordinary high speed brake apparatus such a train would be stopped in an emergency in a distance of from 1,600 to 1,800 feet—considerably over a quarter of a mile. The same train with the most powerful of the electro-pneumatic brakes with 150 per cent of braking power can be stopped:

From 30 miles per hour.....	in 200 feet
From 60 miles per hour.....	in 1,000 feet
From 80 miles per hour.....	in 2,000 feet

A brake test with freight cars on the Southern Pacific Railway showed that a train of 80 oil tank cars equipped with all modern airbrake devices can be stopped:

From 10 miles per hour.....	in 365 feet
From 20 miles per hour.....	in 940 feet
From 30 miles per hour.....	in 1,725 feet

These tables serve to show that beyond a certain speed any heavy moving mass becomes practically uncontrollable, no matter what the power of braking devices may be.

Consider now the possibility of stopping a heavily laden gasoline truck weighing 10 or 12 tons running at a high speed. With all the most modern braking equipment, nothing is powerful enough to stop a heavy mass like that in a sufficiently short time or distance to avoid impending danger in an emergency. While the reckless driving of high-powered gasoline passenger vehicles over public highways is

one source of great danger, the speeding of heavy gasoline motor trucks is no less a menace to human life. Nearly everyone has experienced the feeling of shaken walls and the sight of vibrating pictures and bric-a-brac in his home when a rumbling heavy truck has speeded madly over cobbles and asphalt. Aside entirely from the danger to which pedestrians and other vehicles are exposed, is the element of destruction both of the roadbed and the vehicle itself. The effect of a heavy car at high speed with its ceaseless pounding has a destructive effect not only on the road surface, but on the undersurfaces. The heavy jar loosens the base and plows up the subsurface. The injury of high speeds to the vehicle itself is unmeasurable, and it is the speed element and unintelligent operation which consigns the average gasoline truck to the scrap heap in such a comparatively short time. The higher the rate of speed, the greater the beating and vibration. Vibration crystallizes steel. It damages the truck's motor, springs, radiator, steering gears, etc. Rapid abrasion is most marked likewise under severe braking conditions such as obtain when heavy trucks are stopped suddenly by the application of high braking powers from high initial speeds.

If the speed of a truck entered into the basis of taxation, and, as the rated speed increased the tax rate increased as the square of the speed offenders would be confined within more rational limits. This, in the writer's personal opinion, should be a consideration in an assessment of this nature, and inspectors should be empowered at all times and without warning, to halt a truck, take the driver's place and drive the truck to its limit of possible speed over an approximated level surface. If the actual speed were greater for any reason than the rated or given speed, the owner should therefore be subject to a heavy penalty. As a result of the strict enforcement of such rules, there would be less tampering with speed controls of gasoline cars, and a more safe and sane speed for different sizes of motor units.

The excessive speeding of gasoline trucks is sometimes chargeable to the salesman of the units. In order to effect a sale he will often claim more ground-covering ability than is proper. The average person considering the purchase of a motor truck is inclined to think in passenger or pleasure car terms, especially in the matter of speed. Then again, owners will demand more work from a truck than it should be called upon to give, and the chauffeur or operator in his efforts to show good results and hold his job will accelerate his truck beyond the point of efficiency and safety. Excessive wear and tear resulting from high speeds and reckless handling mean that the truck must remain idle for long periods in expensive repair shops. If a rational speed were the rule, destruction of life and property would be minimized and the total mileage through a long period, a year for example, would be greater because of the continuous performance of the truck as against bursts of high speed neutralized by periods of inactivity while being repaired. Gasoline truck drivers have been known to drive their trucks at excessive speeds on relatively long uninterrupted runs and spend the time thus saved in saloons or other recreations, with a distinct and irreparable loss to the owner and a corresponding danger to pedestrians and other vehicles. If these offenders were effectively discouraged by law, a very much more healthy condition to everyone concerned would result. It is possible to define the maximum of speed for every size of motor truck so that safety is reasonably assured, and as a result the owners of the trucks will not have their expensive equipment reduced to a mass of junk through excessive vibration, jamming

on of brakes and gears, which has such a destructive effect on the mechanism.

Some manufacturers rate the speed of their trucks according to capacity, but in a great many instances the rated speed is greatly exceeded in practice. While it may appear as a far-fetched thought at this time, yet it would not be at all surprising to the writer if in years to come the maximum possible speed for both passenger and commercial vehicles would be fixed by law when such vehicles were to be operated on the public highways. While a conservative and intelligent operator can effectively control the speed of a gasoline motor car, there are countless numbers who become so intoxicated with high speeds that they are rendered incapable of acting with a level head in an emergency. It is bad enough to compromise the safety of life and property by speeding a complicated gasoline car when operated by the average driver when sober, but is hardly short of a catastrophe to allow this powerful piece of mechanism to be placed in the hands of a man whose brain has become stupid with drink, and can rarely exercise judgment and perform the multifarious actions required in emergencies. It is logical to assume that a vehicle not capable of excessive speeds and extremely simple to operate is desirable not only for general use but especially for those whom we will always find who are foolhardy enough to carelessly and wantonly endanger human life.

The record in the magistrates' offices show that the majority of offenders against traffic laws are owners of automobiles, in the case of passenger vehicles. This would indicate that licensed chauffeurs are more careful drivers. However, not even the most efficient automobile operator is proof against the nervous strain and fatigue imposed by the wear and tear of continuous driving through congested traffic. The lives of thousands of pedestrians and automobilists are in peril because of numerous high-powered gasoline cars in the hands of overworked, unpaid chauffeurs and nervous, weak owners, physically incapable of action in an emergency. In taxicab operation, for example, the nature of the work demands almost constant driving through the most crowded streets, the chauffeur working usually from 10 to 15 hours at a stretch. It requires twelve distinct motions to start and stop a gasoline car, and when this is multiplied by the hundreds of both partial and full stops which a car in continuous service must make in the course of a day, it will be realized that the amount of energy demanded of the driver is stupendous. A small commercial delivery wagon is called upon to make from 250 to 300 stops in the course of a day, representing from 3,000 to 3,600 motions, not including the movements necessary in the operation of the mechanism in partially or fully stopping the car in traffic. It will be seen that the operator of this type of motor car may easily make upwards of 5,000 distinct motions in a working day. This means the expenditure of a great amount of energy with its attending drain on vitality. During the winter months the strain imposed on the driver of a gasoline car is increased tenfold. A chauffeur numb with cold and exposure, with the snow and wind blowing about him, cannot be expected to perform well all the complicated actions necessary in driving a heavy gasoline car. Since the advent of the vestibule street car, it has been considerably easier for the motormen to practice "Safety First" than in the day when his mind was distracted by wind and cold to which he was exposed. The writer does not intend to suggest that all automobiles should have vestibules for the chauffeur by any means, but merely wishes to show that physical inability of any kind on the part of the operator of

as complicated a piece of mechanism as the gas car has a direct bearing on the number of accidents, and since a certain amount of cold and exposure in winter weather is unavoidable, the necessity of controlling speed at its source is all the more evident.

The owner who trusts his high-powered gasoline car to an inexperienced, underpaid, overworked man is criminally negligent, if an accident results, to the same degree as is a railroad company or its directors when a fatal wreck results from putting a fast train in the hands of an engineer who is practically asleep at the throttle because of overwork. The state which allows such a condition to exist is not properly caring for the welfare of its citizens. While there are drastic laws making the overworking of engine drivers impossible there is absolutely no legislation preventing an employer from working a chauffeur all day and far into the night expecting him to be fresh in the morning for another nerve-racking day's work. And the public pays the bills—ofttimes in human units!

It is just as logical to assume safety for pedestrians in the operation of such highly complex pieces of mechanism as speedy gas cars in the hands of some operators as it is to have a sense of safety if we should give a child a handful of matches and a cup of gasoline. When we are dealing with dangerous situations it is essential that we revert to the real source and not merely be satisfied in treating with superficialities. Apparently it is not sufficient to enact laws regulating speeds, and a step further may have to be taken licensing only those automobiles with a definite mechanically fixed speed which is less likely of offense. This may be the control which reckless automobile drivers may force the authorities to exercise. Conservative regulatory measures are useless in some instances, notably with the species that swells our death lists by firing "I-didn't-know-it-was-loaded" guns, and those who indulge in the summer sport of rocking the boat. The best thing we can do outside of exterminating the pests is to give them, for the protection of others, an unsinkable boat, if such a thing is made. Likewise it may be necessary to provide fool-proof automobiles for the "gun and boat" type of automobile owners and operators whose crimes are daily chronicled. It does seem a pity that the thousands of sensible automobile owners and operators should have to suffer for the indiscretions of their brethren. But some means must be found to insure safety, and we have learned to our sorrow not to place too much dependence upon the irresponsible.

Chief City Magistrate McAdoo, reports the *New York Times* of Tuesday, November 16, and Police Commissioner Woods agree that finger printing reckless automobile drivers, including owners of cars, would provide protection for the public. However, before this extreme measure is taken, the chief magistrate presents a plan providing that a copy of each summons be sent to his office daily, and that the court clerks be advised each morning as to whether or not defendants are second or third offenders or have no previous record. It might be interesting in this connection to realize that practically all means so far suggested for the protection of the public have to deal with offenders after they have killed or maimed a pedestrian, which is like locking the stable after the horse has run away. What we really need is a condition which will make it well-nigh impossible for incompetent operators to make that first and often fatal offense. The remedy would appear to be largely that of fixed maximum speeds. As a further means of obtaining some valuable data regards automobile casualties it has occurred to the writer that blanks for reporting accidents

should be used by the police, stating exactly the type of vehicle responsible, whether commercial or passenger, horse, gasoline or electric. If results were reduced to a comparable basis it would then be possible to determine chief offenders and corrective measures could readily be adopted. During the first six months of this year 8,075 automobilists were arrested for speeding in New York City, according to the figures issued by Chief Magistrate McAdoo, who is urging a crusade against such offenders. Of these 2,092 were chauffeurs and 983 owners of cars. There were 425 additional arrests, divided between 144 motorcyclists, 165 drivers of horse-drawn vehicles, and 166 cases which were dismissed.

The records show one prison sentence of ten days by Magistrate Murray without the alternative of a fine. Of the other cases 1,969 paid fines, 948 served two days each in jail in lieu of paying fines, and 579 were released on suspended sentences.

Police Commissioner Woods has sent out 5,000 letters to the owners of motor trucks, in which he asked for their co-operation in preventing accidents. After saying that the police department was paying special attention to the motor trucks and had put on extra motorcycle men for that purpose, he suggested that the dangers of the situation would be lessened if motor trucks were equipped with governors which would absolutely prevent the truck from being driven faster than the law allows. Drivers must be prevented from tampering with governors and setting them so the cars can run twenty or twenty-five miles an hour instead of limiting them to fifteen.

D. E. Whipple Explains "Detroit Electric" Success

In a recent interview with D. E. Whipple, branch manager of the Anderson Electric Car Company, with headquarters in Chicago, the questions were asked of Mr. Whipple, "Just what does it require to make a successful electric car manufacturer and just what should the public consider in buying an electric?"

These are vital questions. They are the keynotes which every manufacturer is striving for. The public likewise in making an expenditure for an electric strives for the least indication of assistance in choosing a particular type. In the middle west Detroit electrics, under the guidance of D. E. Whipple, have secured this success and according to Mr. Whipple, for the following reasons:

"In these days of keen competition, in all lines, it is practically an impossibility for any product to receive general approval by the consumers throughout the country unless it is produced by a concern which has devoted unlimited and concentrated thought to the article it is promoting. Only through such effort can a manufactured article hope to successfully compete with its many competitors.

"This fact is strongly emphasized by the success and prominence attained by the Detroit electric automobile during the past several years. First of all the Detroit electric is manufactured by an organization of men which devotes its entire time, energy, thought and money to the development and manufacture of an electric automobile of the very highest type, manufactured so efficiently that it can be offered for sale at a price offering the greatest value to the consumer for the least possible investment.

"Secondly, every official of the Anderson Electric Car Company devotes his entire business day to this particular business. There are no outside influences

taking their thought from the work in which they are engaged. The company is owned and financed by the same circle of men.

"Very often manufacturing enterprises of the greatest importance fail simply because the money required for their promotion is furnished from some outside source. This source may become dissatisfied with the research or preliminary work necessary before results can be attained. When such dissatisfaction arises, the source of money for research work is naturally discontinued and the product even though it may have arrived at a partially developed stage, must be shelved, with result that no one profits and the entire proposition is a miserable failure.

"The Anderson Electric Car Company is indeed fortunate in not being burdened with a possible event of this kind. In fact, this company points with a great deal of pride to its enormous-sized scrap pile as indicative of the large amount of experimental and research work which they have done in developing the electric car. They state that their scrap pile is evidence of a great many things which they have learned not to do as well as evidence of a number of things which they have found to be of merit in the construction of electric cars.

"If every individual buying an automobile, would more carefully consider the organization back of the automobile they are buying, there would certainly be fewer displeased owners. Most careful consideration should be given by every automobile buyer to the manufacturers' ability to produce a car designed on principles which have been worked out after the most careful research. They should satisfy themselves that the company manufacturing the automobile they buy is permanently and exclusively engaged in the production of the car they purchase. They should satisfy themselves that the manufacturing facilities of the concern manufacturing their car are sufficient to produce cars in the most up-to-date and efficient manner, as only through manufacturing in this way can the greatest value be produced at the lowest cost.

"It was recently stated by an acknowledged automobile authority that automobiles should always be purchased on the basis of 'consider the organization first.' The public is coming to a realization of this fact. Electric car manufacturers are likewise seeing the necessity of this element and it has but one answer—an organization of undisputed reputation and bountiful success."

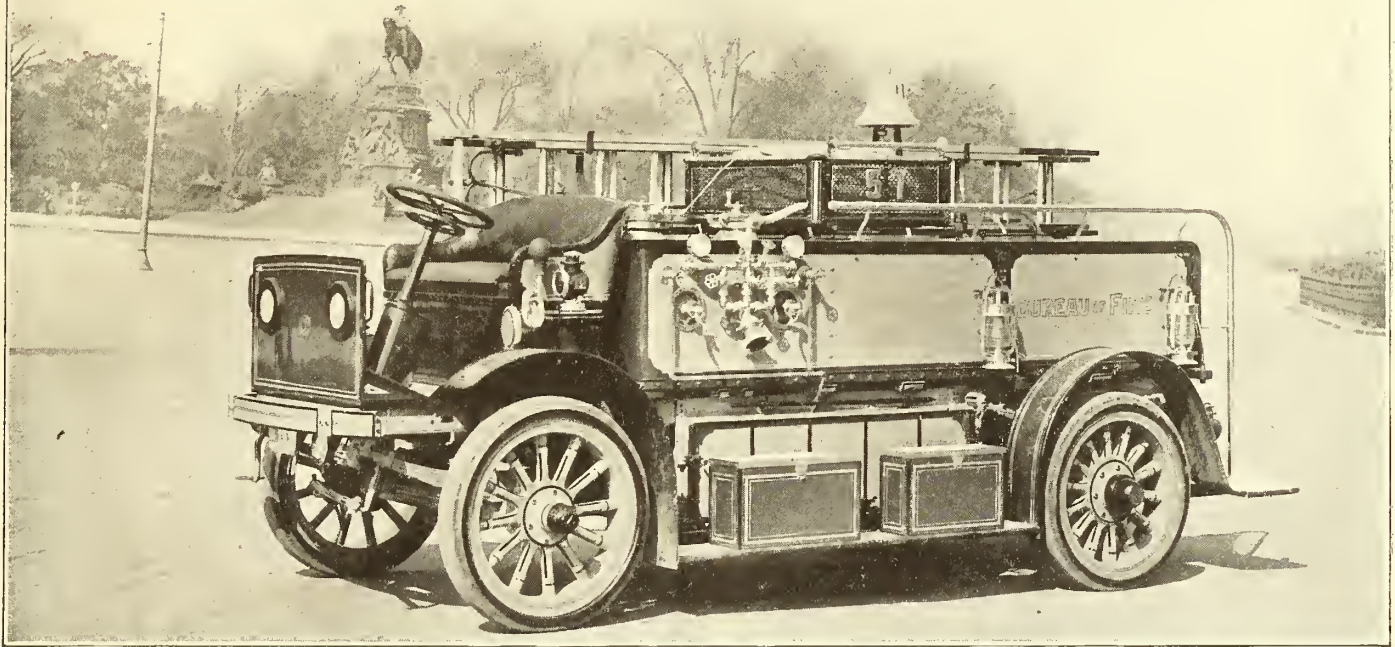
Electric Garbage Wagon in Boston

Economical costs of garbage hauling are obtained by the Sanitary Department, City of Boston, by the use of electric trucks. The city owns two five-ton General Motors Truck Company's dumping wagons, each equipped with a 44-cell, 29-plate Philadelphia battery. The vehicles are charged at night at the garage operated in connection with the Public Works department.

Each vehicle has a capacity of 10 cubic yards of refuse, which consists mainly of ashes collected from private premises and removed to the public dump. An average of four loads a day are hauled, the aggregate mileage being about 25 per day. Six men are assigned to each wagon, the driver, his assistant, who handles the loading, and four street men who roll the barrels to the van and throw them aboard.

Electrically Driven Fire Apparatus

New Jersey Fire Chiefs Test Hill Climbing Ability of Storage Battery Propelled Fire Trucks



Electric Storage Battery Driven Fire Apparatus Built by the Commercial Truck Company.

A DEMONSTRATION of electrically driven fire apparatus was held on the steep grades in and around Paterson, N. J., on Thursday afternoon, November 18. The test proved a great success and showed beyond doubt the speed, power and flexibility of this type of apparatus.

Two trucks were used for demonstration. One was a combination chemical engine and hose wagon, converted from horse drawn to motor driven, by the Commercial Truck Company of America, Philadelphia, Pa. This was fully equipped with twenty lengths of hose and a crew of fourteen men. The weight of the truck, light, is 8,500 pounds and equipped with the hose and crew, 12,300 pounds.

The second piece of apparatus was a 65-foot aerial ladder, which was also a converted horse-drawn truck built by the same company, and carried a crew of twenty-two men. The weight of this piece was, light, 16,000 pounds and with the crew, 20,000 pounds. This latter piece was of the four-motor-drive type, one motor being attached to each wheel.

The first part of the test consisted of a run up an 18.23 per cent grade, known as Temple Hill, having an uneven cobble-stone paving affording very poor traction. This test was easily made by both cars. The time from a dead start at the foot of the hill to the summit for the combination wagon was 1 minute 13 seconds; and for the ladder truck, 1 minute 19 seconds. This former test becomes a record for the hill, which has been used as a test hill for every piece of apparatus used by the Paterson fire department and many other types of apparatus which have failed on the test. The fastest previous time was 1 minute and 40 seconds, made by a Knox combination. One of the electric pieces under test was again sent up the hill,

stopped dead in the center of the steepest part, and then run to the top at the same speed as before. This remarkable feat was very generously applauded by a gallery of some hundreds of spectators.

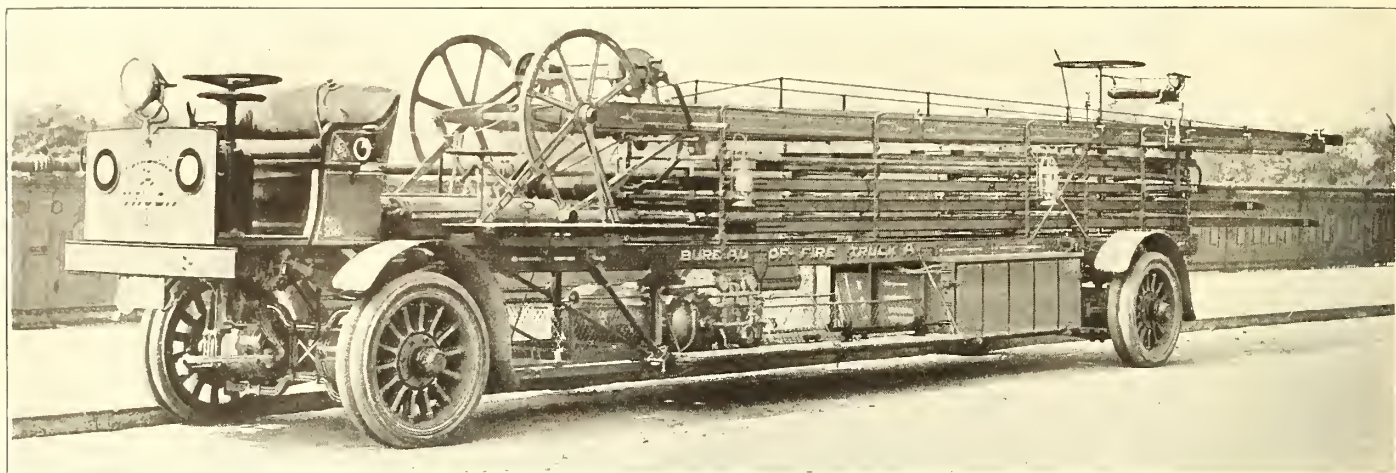
The remarkable part of the latter test was the apparent immediate resumption of speed from a dead stop on the grade which has proved too steep for most of the other types of fire apparatus to climb at all, and which the number of touring cars carrying spectators did not even attempt.

The apparatus was next put through a test on the hill known as the Temple street-Clinton street-Circle avenue hill. This is also over an 18 per cent grade and both pieces easily made the trip, the ladder truck making a new record of 1 minute 14½ seconds and the combination truck, 1 minute and 20 seconds. The best previous time made on this hill was considerably over 2 minutes.

Further demonstration then followed in various parts of the city, a speed of thirty miles per hour being maintained on the level stretch on Broadway from Straight street to East 33d street, a distance of about one mile.

Fire Commissioner Shielke of Paterson, and Chief Coyle of the Paterson fire department were on the driving seat of the combination wagon, and the mayors and commissioners from nearly every nearby city in New Jersey showed their interest by either riding on the apparatus or in the numerous touring cars which followed the test. The Pathe Company took moving pictures of the demonstration for its weekly pictorial review of events of special interest.

The fact that these two pieces, both stock, and not specially prepared for the test, not only met all requirements without effort, but in both cases where



Electric Ladder Wagon, a Converted Horse-Drawn Truck.

previous records have been kept, established new records by a wide margin, aroused keen interest among the large number of officials present, which will no doubt be practically expressed, when their several cities are next in need of fire apparatus.

Fire commissioners and fire chiefs were present from nearly every city and town in Northern New Jersey. Among those present were the following:

Amos H. Radcliffe, mayor-elect, Paterson.

George M. Secar, mayor, Passaic.

George S. Walken, chief mechanic, Philadelphia fire department.

Chief Coyle, Paterson fire department.

Fire Commissioner Shielke, Paterson.

Fire Commissioner S. H. Mundon, Paterson.

George B. Stimson, fire and police commissioner, Paterson.

W. B. Burpo, sheriff-elect, Paterson.

P. S. Pearl, master mechanic, fire department, Passaic.

Chief Davis, Bayonne.

W. F. Carney, fire commissioner, Orange.

Chief E. Sonneborn, fire department, Jersey City.

Fire Chief H. Moran, Caldwell.

E. G. Deckert, chief, fire department, West New York.

John Knoblock, fire commissioner, West New York.

O. A. Miller, city council, Passaic.

Chief Mathews, Orange fire department.

P. H. Bowker, fire chief, Passaic.

A. E. Cross, fire commissioner, East Orange.

C. A. McGinley, captain, fire department, East Orange.

Chief Williams, Montclair.

George B. Astley, fire commissioner, Newark.

Ex-Chief Lubcon, Haledon fire department.

Captain Ward, chief mechanic, Paterson.

J. Kehoe, fire commissioner, Passaic.

Officials from the Public Service Electric Company, the Commercial Truck Company and the Electric Storage Battery Company were also in attendance. Exide batteries were used in the vehicles.

After the tests the apparatus were given a boosting charge and started back on their return trip to Philadelphia. At Newark a stop was made to exhibit the pieces to the fire board there, where another short demonstration was given, and again at Elizabeth the cars were shown to the local fire board.

It is interesting that the run from Philadelphia to Paterson, approximating 125 miles, was made in fourteen hours, elapsed time. This includes stops at Trenton, New Brunswick and Newark for boosting the batteries.

Every year produces greater development in electrically driven fire apparatus. The fact that it is free from liability of fire, breakdowns from complex mechanical arrangement, and its reliability to start and travel at a satisfactory speed, makes this type very promising.

Anderson to Exhibit at Automobile Shows

G. D. Fairgrieve, general manager of the Anderson Electric Car Company, was in Chicago, accompanied by E. P. Chalfant, manager of the eastern division with headquarters in New York City. Both gentlemen were interviewed at the Chicago branch offices of the Detroit Electric. Mr. Fairgrieve is enthusiastic concerning the New York and Chicago shows. "The Anderson Electric Car Company," said Mr. Chalfant, "has taken one of the largest spaces at the shows both in New York and Chicago."

"It will be the opening of a record year for the Detroit Electric and we have many plans for the exhibit at the Buffalo show, which will make our display one of the most original and attractive. The enclosed car is to be the great feature for all-year driving."

In response to the question of the influence of the enclosed car, G. D. Fairgrieve said:

"Never before in the history of our company has the sales outlook been so bright. During the nine years the Anderson Electric Car Company has been in the business it has been a leader in its field. It is evident to the experienced observer that the public wants enclosed automobiles now more than ever before—and it insists on having them. On every hand you hear instances of men who have driven a number of different types and who now admit that they would not think of giving up the enclosed car for all-year driving."

"Many of these men have chosen the Detroit electric as being the best enclosed car on the market, being so perfectly ventilated that you enjoy touring car coolness in summer and limousine luxury in winter."

"And the 1916 Detroit electrics have plenty of mileage, power and speed. As an actual matter of fact, they are as efficient as any automobile for 98 per cent of all motoring trips."

Measured Service vs. Flat Rate Service

A Discussion of a Vital Feature of the Electric Garage Business at Present Instigating Much Consideration

ANY garage men are becoming convinced of the inequitability and illogical business policy of the flat rate system for electric garages. If it covered only storage and washing as it does in gas garages it would not be bad; but even in the matter of washing it would be better for the owner if the car was washed only when needed, and he were charged only for what he got. The car itself is injured by too frequent washing and 2 or 3 washes a week are usually ample excepting in bad weather.

Measured service for washing is now the rule in some gas garages and it should be in electric garages; but in the two large and extremely variable items of electric current and hiking, that is, delivery and fetching cars it is absolutely impossible to do business fairly and economically on the flat rate basis.

The proprietor of a large exclusively electric garage in Chicago, that has been running on the measured service plan for several months, and who is firmly convinced of its business advantages furnishes the following statistics for twenty average, unselected cars that were running from his garage during the month of October, 1915. The great variation in cars in the amount of electricity required is according to the condition of the battery and in the consequent cost per mile; the variation in the mileage and in the service rendered in hiking is at once apparent upon inspection of the following table. These figures are exact excepting as to the rates of 17 cents for delivering and fetching cars, and \$25 per month for storage and general care. These latter are given merely for examples. It is believed that the hikes should be 22 cents each with a discount of 7 cents each when the customer calls and takes a man home to bring back the car or when the distance is less than one-third of a mile.

He believes also that finally it will be best to charge \$10 per month for storage alone, and fixed rates for washing and every other service rendered. There is no reason why the man who requires only moderate service should pay the same as the one who requires three times as much, just as American plan hotels charge measured service for rooms if you so desire.

In order to please the greatest number, it is possible that a flat rate high enough to meet all contingencies, for a few customers, and measured service for others would be best in some garages. Forty-five dollars a month for those patrons that wished flat rates and who do not run to exceed 500 miles per month, with two cents extra for each additional mile is more nearly correct, excepting where batteries are in bad condition and then the charge for electricity

necessarily would have to be proportionately more.

The greatest difficulty with many garages in adopting the measured service comes from the large initial expense for meters but the Commonwealth Edison Company is now offering to furnish meters to any garage owner at 50 cents per month, which is a very reasonable charge; and every meter would save the garage owner much more than this every month. The expense of installing these meters is very moderate.

It has been proposed to charge for electricity by the mileage made.

This would not be difficult if the garage had a few meters wherewith to check up on the cars and if all owners had odometers, but this is not worth while when meters can be rented so cheaply. Records of twenty average unselected cars on good roads and fine weather.

Measured service is an important topic in the electric garage industry. For some time electric garagemen have realized that there is something radically wrong with the garage business. Garagemen have never succeeded in making a fair return on their investment. Many are losing money. The method of measured service seems to offer a life saver. It means to the garageman a method of charging the user for what he gets and, more important, finding out for himself just what each branch of the business earns or loses and how to correct a department showing a loss. The public on the other hand can figure out for themselves how they are being charged and if such charge is fair or unfair. Measured service is certain to bring about a millennium in the electric car industry.

Car number	Size of car: Small, Med., Large	Condition of battery: Poor, Fair, Good	K. W. H. electricity used	Miles run in October, 1915.	Miles per K. W. H.	Cost of electricity per mile at 5c per K. W. H.	Cost of electricity for the month at 5c K. W. H.	Times car was delivered and brought in (hikes)	Cost of hikes at 17c each	Total, \$25 for general care, plus cost of electricity and hiking
1*	S	F	181	421	2.3	\$.0217	\$ 9.05	55	\$ 9.35	\$43.40
2*	S	F	184	398	2.1	.0219	9.20	..	..	34.20
3	S	G	223	763	3.4	.0147	11.15	62	10.54	46.49
4	M	P	259	737	2.8	.0240	12.95	52	8.84	46.79
5	M	P	175	276	1.5	.0333	8.75	51	8.67	42.42
6	L	P	182	307	1.6	.0312	9.10	..	..	34.10
7	L	P	487	962	1.9	.0263	24.35	..	..	49.35
8	M	F	294	680	2.3	.0217	14.70	60	10.20	49.90
9	M	F	227	620	2.7	.0185	11.35	46	7.82	44.17
10	L	F	50	117	2.3	.0217	2.50	27	4.59	32.09
11	L	F	166	390	2.3	.0217	8.30	33	5.61	38.91
12	L	F	191	496	2.6	.0191	9.55	47	7.99	42.54
13	M	F	76	263	3.4	.0147	3.80	49	8.33	37.13
14	L	G	94	322	3.4	.0147	4.70	32	5.44	35.14
15	M	G	181	635	3.5	.0142	9.05	61	10.37	44.42
16	L	F	94	309	3.3	.0151	4.70	37	6.29	35.99
17	L	G	274	830	3.	.0166	13.70	61	10.37	49.07
18	M	G	132	506	3.8	.0131	6.10	21	3.57	34.67
19	L	G	146	595	4.	.0125	7.30	26	4.42	36.72
20	M	G	226	971	4.	.0125	13.30	55	9.35	47.65
Average	.....	.....	.....	5.29	2.8	.0195	.....	..	.....	42.50

*30-cell battery.

In the accompanying table the electricity used for these cars varied from 50 to 487 kwh. for the month. The mileage varied from 117 to 971. The cost per mile varied from 1.25 cents to 3.33 cents. It has heretofore been supposed that there would be much difference in the amount of electricity used by small and large cars; however, it is found that there is practically none providing the batteries are in like condition.

It will be noted that small cars 1 and 2 got only

2.3 and 2.1 miles per kwh. respectively because their batteries were in only fair condition, and had only 30 cells each, so that resistance had to be put in when they were charged and thus a large amount of electricity was burned up and wasted. A larger car (No. 13) with the battery in a similar condition got 3.4 miles per kwh. Cars 5 and 6 with poor batteries got only 1.5 and 1.6 miles per kwh. respectively.

The variation in cost with batteries in fair condition is shown by an analysis of the records of—small cars 1 and 2 which cost 2.18 cents per mile; medium size cars, 8 and 9, which cost 2 cents per mile; and large cars, 10 and 11, which cost 2.17 cents per mile.

The average for these six cars, batteries in fair condition, was 2.14 cents per mile but the small cars cost more than the others. Taking five cars in which the batteries were in good condition, Numbers 3 small, 15 and 18 medium and 17 and 19 large, the relation remains much the same viz. 1.47 cents for the small, 1.37 cents for medium and 1.43 cents for the large or an average of 1.42 cents per mile. Unfortunately for the comparison this garage has very few small batteries but because of the resistance required, they uniformly cost more to charge than large ones. There were no small cars in which the batteries were in poor condition, but with the medium and large cars the average cost was 2.56 cents per mile. The principal difference in cost is thus shown to depend, not on the size of the car, but on the condition of the battery; but it must not be overlooked that these records were made during the month of October when weather and road conditions were ideal, and the cost would be considerably more in bad weather with skid chains and muddy or icy roads. It is impossible to be absolutely fair to customers without metres for each car. If we add 25 per cent for bad weather, charges based on mileage, of 1.78 cents per mile for batteries in good condition; 2.67 cents when in only fair condition and 3.20 cents when they were in poor condition would be very much fairer for owner and garage owner than flat rates.

An analysis of the foregoing table seems to show that the average cost of electricity for all kinds of cars, in all kinds of weather, and with all conditions of batteries is 2.55 cents per mile at 5 cents per kwh. Where cars are charged at home the cost of electricity averages about $6\frac{1}{4}$ cents per kwh. or 3.19 cents per mile.

The owners of three of these cars saved much by calling for their cars themselves.

Where measured service comes in competition with flat rates, the best class of customers, who want to pay for what they get, and who have fine cars and good batteries naturally tend to the garage with measured service, while worn out cars and poor batteries gravitate to the flat rat garages and cause them a constant loss.

There is no doubt that 5 cents per kwh. is a reasonable rate for electricity.

It will be asked whether seventeen cents for delivering or fetching a car is right. In answering this we need only to call attention to the well known fact that employers of labor in manufacturing and other business where the outlay for workmen's compensation, liability and other insurance, rent, taxes, interest, depreciation, etc., are relatively high find it necessary to charge up to the business double the amount actually paid for labor in order to cover overhead charges. Even larger charges appear necessary for

the garage owner to protect him from greater hazards.

In another garage, with a large number of cars and for a long series of months, it was found that the actual cash paid the men for services amounted to between eleven and twelve cents for each hike, therefore, they ought to be charged up at an average of 22 cents each. The charge for storage and general care of car in a large city should not be less than \$25 to \$30 per month.

As the winter comes on we hope to be able to publish records from these same cars, that compared with this table will show the influence of stormy weather and bad road conditions on the amount of electricity used.

Chicago Electric Climbs Lookout Mountain

L. M. Barton, in a late model Chicago electric, recently made a trip to the summit of Lookout Mountain, from Denver. The total mileage from the garage



Chicago Electric Roadster at the Summit of Lookout Mountain.

to the top of the mountain and return was 50.5 miles.

The maximum altitude reached was 7,200 feet. The best idea of the grade can be gained from the following information. At intervals on the climb sign



Just Before Making the Mountain Climb.

posts have been established, giving the altitude reached and other information. The following covers a number of these road signs:

Grade		Altitude		Grade		Altitude	
per cent	feet			per cent			feet
480 feet.....	5.0	6,524		833 feet.....	3.0	6,754	
830 feet.....	3.6	6,547		3,257 feet.....	6.1	6,789	
1,875 feet.....	6.0	6,577		675 feet.....	6.0	7,045	
1,600 feet.....	4.0	6,689					

The total distance from the bottom to the top of Lookout Mountain is six miles.

Operating Features of a Large Electric Garage

Charging Equipment, Wiring Arrangements and Switchboards Devise for Garage and Battery Departments

THE Exide Battery Depot & Electric Vehicle Garage, at 527-541 West Twenty-third Street, New York City, described in a recent issue of *ELECTRIC VEHICLES*, is one of the largest plants maintained for battery repair and assembly and electric vehicle charging. One of the operating features of this station is the method employed for energizing batteries by starting the charge at 105 volts and finishing at 125 volts when necessary, thus minimizing the loss of energy in rheostats. The lower voltage is usually high enough to maintain the desired charging rates until 80 per cent to 90 per cent of the energy necessary for recharge is put into the batteries. This effects a saving of from 12.5 per cent to 15 per cent in the power bill.

The garage is wired with eighty circuits of 100-amp. rating each. The switchboard room contains one main distribution panel carrying an ammeter and a recording voltmeter for each bus and a charging-circuit switchboard made up of ten panels of eight circuits each. The arrangements of the wiring for these

er charging rate can no longer be maintained with the 105-volt supply, the switch is thrown into the rear position connecting the battery to the 125-volt busbars. The purpose of the broken-back switches is to permit reading current in various circuits. When a circuit is connected with the lower voltage busbars, the current is read by throwing the lower broken-back switch to the lower position. A similar operation is performed with the upper switch to read the current when the battery is connected with the 125-volt circuit. The current is read on separate ammeters in each case. The voltage of any battery is read by inserting the plug into a receptacle over its particular circuit. Two ammeters, one for each busbar, and one voltmeter suffice for each set of eight circuits. With these connections there is no possibility of inter-connecting the 125-volt and 105-volt busbars.

A modified constant-potential or maximum-voltage method of charging is used. The daily charge is begun at approximately 90 amperes for all batteries regardless of the size and maintained at as high a charging rate as possible until the voltage of the battery reaches a point indicating that the cells have begun to gas, this being approximately 103 volts for forty-two-cell batteries and 107 volts for forty-four-cell batteries. When the gassing voltage is reached, the charging current rate is regulated by means of the rheostats so that the voltage will rise no higher until the current has been gradually reduced to the "finishing rate." As noted previously, when the desired current can no longer be obtained on the 105-volt bus, the battery is changed over to a 125-volt bus by means of the corresponding single-pole double-throw switch. When the charging rate has been reduced to the finishing rate by regulating it to meet the gassing voltage as noted above, the finishing rate is maintained until the battery voltage reaches a point at which it remains constant for three consecutive readings taken at one-hour intervals, when the daily charge is considered completed. It is important when charging by this method that the charge be continued to a maximum voltage and not a fixed voltage. The maximum voltage of batteries of the same number of cells will vary somewhat for batteries of various-sized cells and varying ages and types of plates and also with the same battery at different temperatures, so that the maximum voltage must always be used to determine the completion of the charge and never a fixed voltage.

The form used for recording daily charging data is shown at the top of Fig. 2, typical charge readings being given for four trucks. Printed figures over the vertical columns are the hours from 7 P. M. to 6 A. M., and the double figures in these columns show the current rate in amperes and the battery voltage respectively.

Once a week each battery is pulled out of its corresponding truck and flushed with water just before the regular charge. Toward the finish of this charge, following flushing, hourly readings of gravity and temperature of two pilot cells are taken, and the charge is continued until three maximum gravity readings for

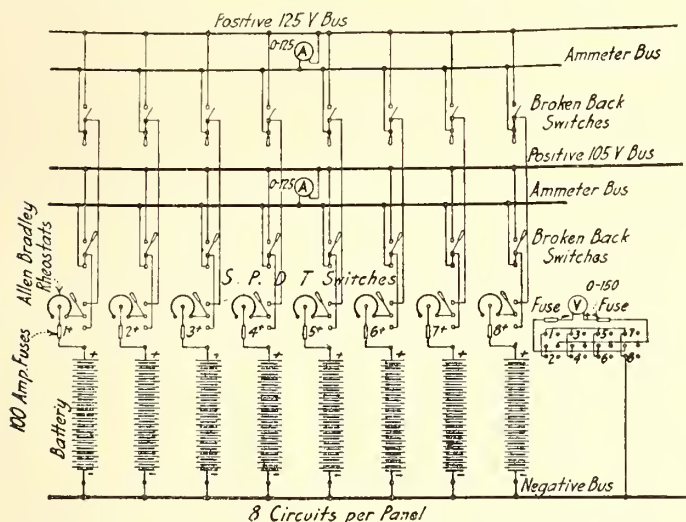


Fig. 1.—Switch Connections for One of the Ten Charging Panels.

panels are shown in Fig. 1. All of the switches in the same vertical row are for the same circuit. The upper clips of each row of broken-back switches are connected with the positive 125-volt and 105-volt busbars respectively, while the lower clips are connected with the separate auxiliary busbars. Between the different voltage busbars and their corresponding auxiliary busbars are ammeter shunts. The hinges of the broken-back switches are connected with the forward and rear clips of the double-throw switches. The hinges of the latter are connected with their particular battery-charging circuits through Allen-Bradley carbon-pile rheostats. The negative cables run directly to the charging plugs and do not enter the switchboard room at all. A common negative is used for both buses.

When starting to charge, the double-throw switch is thrown in the front position, which connects that circuit with the lower-voltage busbar. When the counter emf. of the battery builds up so that the prop-

Fig. 2.—Some of the Forms for Recording Conditions of Batteries.

Sheet No. 1811 shows some records on vehicle charging. By inspecting the figures it will be seen that the first battery was fully charged when the voltage reached 108 volts, the second and third batteries not until they attained 114 volts, and the fourth battery when it attained 112 volts, indicating that the maximum rather than a fixed voltage should always limit the charging period.

both cells have been obtained. The readings of gravity and temperature of the two pilot cells determine the completion of the weekly equalizing charge and also serve as a check on the daily charges.

Once a month at the end of the equalizing charge individual-cell gravity and voltage readings are taken. If the specific gravity of the electrolyte is higher than 1300 or lower than 1250, or if the pressure of any cell at the finishing-charge rate is higher than 2.75 volts or lower than 2.40 volts, the cause is promptly investigated and corrected. Individual-cell gravity and voltage readings, as taken at the time of the monthly inspections, are reported on forms like that shown at the center in Fig. 4. Readings of gravity and voltage outside the limits noted above for individual cells may be caused by a small short-circuit inside cells, by careless equalizing, or by wash water getting in owing to drip covers needing repairs. It is always important to remedy trouble of this kind at the first indication.

Readings taken on daily charge, weekly equalizing charge and monthly inspection are turned into the office for checking and criticism after they have served the purposes of the garage. The garage is also equipped to make any mechanical repairs necessary and to overhaul vehicles thoroughly.

The battery depot is equipped to supply parts, make repairs and renewals, and build up new batteries for both pleasure vehicles and electric trucks, and will perform the same services for starting, lighting and ignition batteries for gasoline cars. This portion of the plant is subdivided into a storeroom for parts, received from the factory in Philadelphia, and into two battery rooms, one for handling pleasure-car and truck batteries and the other for handling starting, lighting and ignition batteries. The charging equipment in this battery room consists of a switchboard

having two panels of four circuits each, giving eight 125-volt charging lines, on each of which about forty-five cells in series can be charged. From this it will be seen that more than 100 three-cell batteries can be charged at one time.

The switchboard in the vehicle-battery room is arranged differently from that used in the garage. It consists of four eight-circuit panels and a corresponding number of carbon-pile rheostats. Each panel contains sixty-four plug receptacles, the upper row connecting with the negative busbars, the next two rows with opposite terminals of the battery-charging circuits, the fourth and fifth rows with the terminals of rheostats, the sixth and seventh rows with the 105-volt and 125-volt busbars respectively, and the lowest row with the discharging busbar. Thus by placing jumpers between receptacles in rows 1 and 2, 3 and 4, and 5 and 6 in the column having the same number as the circuit to which the battery is attached the battery will be connected across the 105-volt busbar. Changing the jumpers between 5 and 6 to join 5 and 7 will place the battery on the 125-volt circuit, and bridging 5 and 8 will connect the battery for discharging.

After a battery has been assembled or repairs completed it is connected for charging at a low rate. Readings are taken on each cell in the battery to determine whether the cells are properly connected. Following this, readings of gravity, temperature and current are taken every six hours on a pilot cell and the charge is continued until the pilot cell reaches maximum gravity.

When this point is reached, indicating that the charge is completed, gravity and voltage readings of the individual cells are taken and gravity of the cells is adjusted so that all cells read between 1270 and 1280.

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Electric Vehicle Prosperity

IN the last few months the United States has witnessed one of the greatest publicity campaigns ever promoted. Electrical interests, systematically organized, have spent fabulous sums in an exhaustive campaign calling attention to "the electrical way." Electricity in its various applications has been featured in every possible medium reaching the public. Specially prepared publicity has appeared in all of the leading mediums, including metropolitan newspapers, country weeklies, national magazines, trade organs, bill posting, booklets, pamphlets, circulars and general correspondence.

Central stations, electrical organizations and the trade in general have all co-operated in this gigantic project. The results have been most satisfactory. Electrical prosperity has been read by everyone. Many who thought of electricity as applied only to house lighting, telephones and propulsion of machinery and street cars have had an opportunity to see it applied in a thousand other devices, and very prominently in the modern electric automobile.

The good electric has been featured vigorously in this wide spreading campaign. Electrical exhibitions, central station displays, sociability runs, parades and privately conducted demonstrations have caused many to become interested in the electric. Previously but a very few people ever knew much about the electric. Today the world is thoroughly acquainted with its merits. It is stated in electrical trades that sales will increase fifty per cent. It is fair then to assume that the increase in interest in the electric will have a proportionate influence on electric car sales.

The great bulk of electrics have been built in the past five years. During this period development has been practically independent of other affiliations. In the last campaign it has been recommended with other acknowledged successful products of electrical nature. Electric car dealers who previously found it necessary to first educate the user, will now find that the electric is already known, exploited and accepted, the only consideration being a matter of type rather than a method of propulsion.

The coming year should produce a new era in the electric car industry. Ample revenue arising from increased sales will create new life, more enthusiasm on the part of central stations, dealers and accessory manufacturers. The good electric will come into its own coupled with the recommendation of the electrical world behind electrical products which have already proven a better way—more economical, more reliable and more efficient.

A Trade Opportunity

AUTOMOBILE manufacturers are again confronting the annual automobile shows. January and February are the months when these popular yearly exhibitions are staged. For a number of years the annual automobile show has been quite a problem to electric car manufacturers. Many have become enthusiastic believers in these displays. Others have

rather dreaded them, especially the exorbitant expenditures attached to the preparation of exhibits. Freight costs of transporting special models, extra sales assistance and other expenses amount to considerable sums. Some of the smaller companies have gone so far as to avoid completely the annual events. One thing is certain, however; the annual automobile shows, although expensive from every angle, are a necessary stimulant to the trade. They give the public an opportunity to see just what manufacturers are strong enough to stand the pace financially. Further they present an opportunity for the public to investigate and examine without the usual embarrassment of being pestered later with salesman both at home and at the office. Also they often create an interest in the electric which never would have been born if the casual observer had not had opportunity to see the actual vehicle amidst beautiful surroundings and exhibited at an exclusively automobile display. Taking the exhibitions as a whole they furnish splendid advertising. Manufacturers and dealers find many new prospects. Actual sales are made on the floor. In this way the exhibits earn their investment in the long run. Every electric car manufacturer should be represented. The more the better, and the bigger the industry appears to the public. As a rule the shows in New York and Chicago attract practically all of the manufacturers. Manufacturers should exhibit just as vigorously in the smaller cities where electric car progress is not so great. These are the fields which need developing; there the electric is practically unknown and where a few actual models properly demonstrated would open in new and valuable territory. One of the principal reasons why the electric has not advanced faster than it has is because of the fact that manufacturers have not attempted to exploit electrics in smaller cities, many of which have exceptional facilities. The electric should not be restricted to only certain fields. It is a universal car and this message should be carried to those in the outlying cities in order that the field may be extended and sales increased.

The Self-Charging Electric

THERE is nothing new in the idea of a gas-electric car, and if we speak of it now it is because we believe there is a possibility that it is destined to play some part in the future of this industry. As most people know, the gas-electric is really an electrically propelled car with a storage battery as usual; but for charging the battery the car carries its own gasoline engine and dynamo. It is thus wholly independent of charging stations and indifferent central station companies.

The idea, though not new, is capable of much development and improvement. It is not paradoxical, though at first glance it may seem so. Being on the job all the time, the gasoline engine and generator may be very small. And because the storage battery is being charged all the time it, too, may be much smaller than usual. So the battery and charging plant together may occupy no more room and weigh no more than the battery generally used. The car remains an electric, with all its advantages, and gains all the range and freedom of the gas car.

There are so many interesting features about the gas-electric that we would not be surprised to see some modification of the principle offered the public before long. But it should not be called by that name. It must always be primarily and fundamentally an electric—a self-charging electric, if you like.

It must be frankly admitted that the drawback—the only one—of the electric is its inability to explore the long reaches of cross-country road where charging stations still are unknown. The self-charging electric could go into any wilderness accessible to the gas car, and negotiate hills and holes that the gas car driver carefully avoids. For that kind of competition with the gasoline fraternity, if for no other purpose, the self-charging electric would find a ready place.

Ohio Electric Driven on Ball Room Floor

Novel Demostration One of the Big Features at Providence, R. I., Electric Show

AN electric coupe driven about a ballroom floor was one of the unusual sights at the Providence, R. I., Electric Show, held during the week of November 29 to December 4 in connection with Electrical Prosperity Week celebration. The show was held at Rhodes on the Pawtuxet, a famous New England dancing resort, situated on the Pawtuxet river, just outside Providence.

Irene Dew Crane, whose father, Harold C. Crane, is the local distributor of Ohio electric machines, drove a model 41 Ohio around the big dance floor, which is the chief attraction at Rhodes. During an intermission in the dancing, all the lights in the big ballroom were suddenly switched off, the orchestra played softly, and a beautiful electric car with headlights and interior lamps aglow was seen driving out on the dance floor. Seated inside were Miss Crane and a companion. The beautiful machine circled the floor in every direction and a complete demonstration at different speeds and in reverse gear was given. This demonstration was so impressive and such a novelty that the large audiences which witnessed it each night of the show broke into loud applause as the machine gracefully and quietly left the dance floor for an ante room where it was exhibited. Miss Crane is a skilled driver and handled the car with such facility and ease that no one who witnessed the novel performance could help admiring it.

The electric show occupied the large balcony of the ballroom. Many local merchants and several manufacturers of electrical goods were induced by the Narragansett Electric Lighting Company of Providence to co-operate in displaying and demonstrating their merchandise.

Every type of lighting fixture was shown as well as a great variety of appliances for household and factory use. Prominent among the exhibits were those of the lighting, power and appliance divisions of the Narragansett Electric Lighting Company. A large number of Mazda lamps were used in the lighting displays and a great profusion of household appliances was shown on the tables which made up the exhibits in this division. Demonstrators were on hand, and toast and coffee, electrically prepared, were served to the visitors.

An electric hen was one of the many novelties which caused a great deal of interest. A number of fluffy little chicks which had been hatched by an electric incubator, ran about an inclosure as happy and contented as though they were being mothered by a

flesh and blood hen instead of an electrically operated device.

Flat irons, foot warmers, toilet requisites, a great variety of vacuum cleaners, flash lamps, electric lanterns, electric pumps, wiring appliances, and electrical material of every description made up the varied displays.

Dancing of a quality, for which Rhodes-on-the-Pawtuxet has been famous for years, was made especially interesting during the week by an offer of six electrical prizes to the three couples each night who were the fortunate winners in a contest so arranged that anyone could win. Thirty-six of these prizes were given during the week. At times during the dancing the beautiful ballroom was transformed into

an enchanted place by means of soft, diffused, many-colored lights projected from invisible fixtures above the ceiling.

Motion pictures, different films being shown each night, illustrated many phases in the manufacture of electrical goods and their application in every day service. Most interesting among these films were: Views of the Westinghouse electrical plant at Schenectady and a film called "Spinners of Speech," in which the growth of telephone service in the United States was graphically shown.

It is very likely that the show will be repeated next year with additional novel displays and demonstrations. The Narragansett Electric Lighting Company deserves a great deal of credit for their work in exciting the interest and securing the co-operation of merchants and manufacturers, which resulted in the very attractive and educational displays that proved a drawing card for thousands of people during the week they were shown.

Best Possible Skill for Automobile Building

In this age of automobile manufacture, it should be realized that some of the best brains in the world are working on this most important industry, as the automobile has become a general necessity for the American family rather than merely a sporting apparatus, as it seemed to be when first it appeared on our streets.

With the general use of automobiles throughout the country has come the necessity for building them better, making them more substantial, more simple, more inexpensive in operation and more practical for general family use.



Miss Crane and the Ohio Electric Which Made the Exhibition.

New Charging Apparatus for Garages

Cutler-Hammer Equipment with Many New Developments of Advantage

FOR garage work it has been a practice in the past in the case of any considerable size equipment, say from six circuits up, to use slate panels mounting at the top an ammeter and voltmeter and below the meter in succession six double-pole double-throw knife switches and fuses, it being the idea to throw the double-pole switch, to the hinges of which is connected the battery, to one side to connect the ammeter into circuit and to reverse the throw to cut the meter out of circuit: voltmeter readings on each battery being taken by some sort of a push button, or in some cases by a six-circuit voltmeter switch mounted at the top of the panel.

The charging rheostats are generally mounted above the slate panels, the levers on the switch heads protruding through the rheostat case, and being manipulated by means of some sort of a rod with a ring on the end of it.

The chief objection to this type of apparatus is that there is quite an arc drawn at the moment of transition from meter reading to non-reading position of the knife switches. In other words, in throwing from the meter circuit to the line circuit there is always an arc drawn, which is, of course, very destructive to the switch blade and contacts, and in the case of Edison batteries charging at extremely high currents there is also the danger of the operator's hands being burned.

Fig. 1 shows a single section of the new Cutler-Hammer book-case type of panel. The slate itself is obtained from the Monson Maine quarries, being the best that can be used for electrical purposes. On each slate section is mounted a low-current circuit-breaker, a slider type of rheostat, one pair of battery fuses, a pilot light, light fuse and a meter-reading switch.

The low-current circuit breaker is pivoted at the bottom, and cannot be closed unless the slider cross-head is at the extreme left-hand side of the panel. In

other words, it is mechanically interlocked with the slider cross-head, thereby preventing the operator from throwing the battery on the line with the resistance all cut out. The circuit-breaker is held closed

by means of the pivoted armature engaging the pin clearly shown at the top of the circuit-breaker, the holding magnet itself passing the full or series current. The circuit-breaker in this side has a holding range of approximately eight to one, that is to say, if the

series coil is designed for 60 amperes the breaker will hold closed down to approximately 7.5 amperes. The slider cross-head acts simply as a means of bridging from the upper to the lower set of buttons, the resistance being connected from button to button contacts on the upper and lower rows.

It is apparent, therefore, that the carrier arm does not carry current, the current being taken from one copper shoe to the other one by means of double pig tails. There is also some current carried across by means of the heavy bronze flat springs on the under side of the cross-head.

The pilot light is connected directly across the battery terminals, and lights up whenever a battery is connected to that particular section. The meter-reading switch on the extreme right has three positions, one of them the normal, that is the position as shown on the photograph, which allows the current to flow

from the bottom track through the laminated copper brush on the under part of the switch lever to the small segment clearly shown at the top. This segment is connected to one side of the line. The meter reading position is obtained by moving the switch lever to the right as far as it will go and against the tension of a spring.

This allows the main current to flow from the lower track to the small segment to the right at the top, connecting in the ammeter, and at the same time the two small contact springs under the right-hand stop

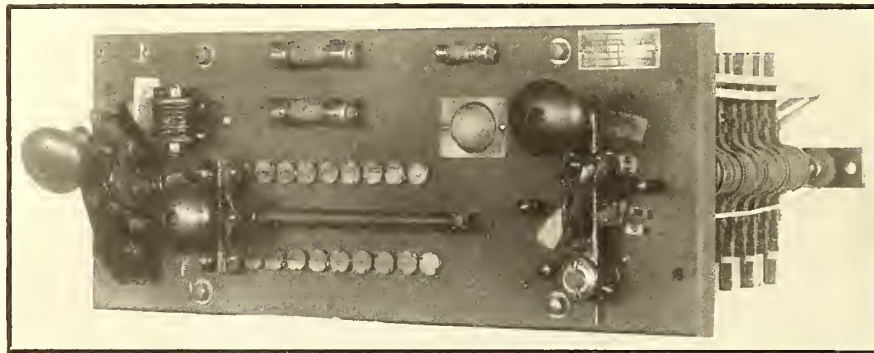


Fig. 1.—Near View of Standard Unit of Book-Case-Type Charging Panels.

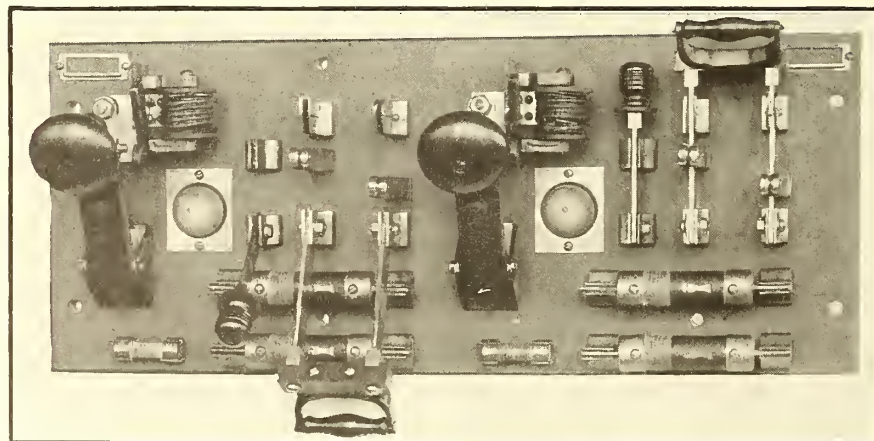


Fig. 2.—Battery-Charging Board with 36 Standard Units.

post are short-circuited by a brass strap carried on an insulating fiber support on the lever, so as to complete the volt-meter circuit to the battery. It is evident, therefore, that ammeter and volt-meter are read simultaneously, and that upon letting go of the handle on the switch lever it will return to its normal position, that is the position with the meters both out of circuit, without drawing an arc, for the simple reason that in the process of transferring from the meter to the non-meter position the meter itself is simply short-circuited and then cut out of circuit.

There is one other position for this meter switch to assume and that is the one obtained by moving it over against the left-hand stop post, in which case the line circuit itself is opened, but there is no burning of the contacts or the brushes, as the arc is drawn on a blow-out roller and copper pencil held by a spring in contact with the roller. This spring is clearly shown on the top of the lever. To prevent burning of the contact roller a powerful magnetic blow out is provided, the magnet itself being mounted on the rear of the panel, the windings being designed to pass full series current.

If this meter switch is moved to this open-circuit position, circuit to the battery, of course, is opened and the low-current circuit-breaker automatically opens, and since the circuit-breaker is connected into one side of the line, the meter switch into the other, double-pole protection is provided without the necessity of a knife switch.

The resistance grids are carried by a strap iron on one end, and on the other end by a steel crab, which is fastened in turn to the rear of the slate panel.

Each section is completely wired and assembled before being mounted in the frame.

With the particular size of front shown in the illustration, 16 steps of adjustment are usually provided, the capacity of the front itself being 90 amperes.

With this sectional or book-case type of equipment it is only necessary to remove four bolts from the slate and two from the steel strap holding the rear ends of the grids, to entirely remove it from the frame, just the same as one would pull a drawer out of a cabinet.

Fig. 2 shows an equipment made up of thirty-six of these standard sections, each section being designed to charge 42 lead cells at 40 to 8 amperes from a line voltage of 115.

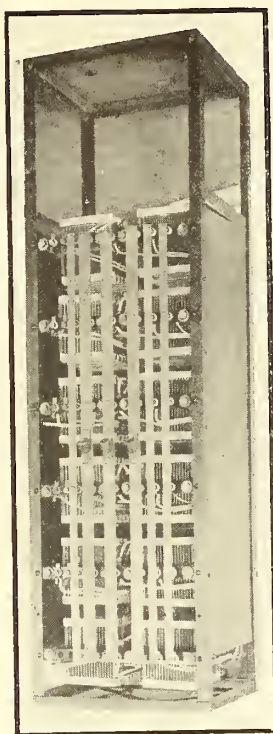


Fig. 3.—Rear View of Six-Section Panel

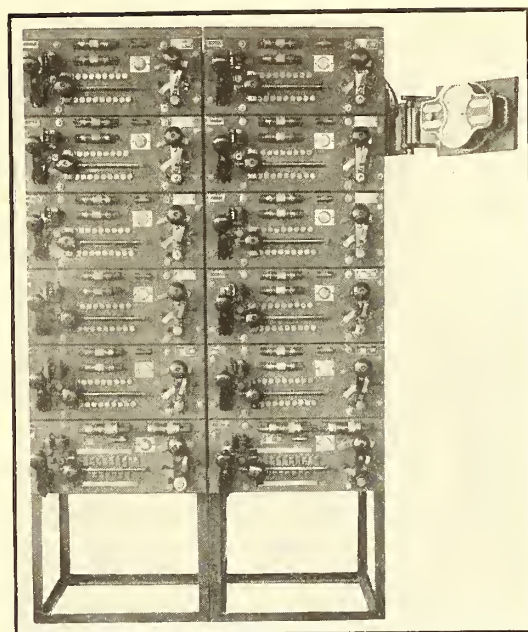


Fig. 4.—Board with Ten Standard and Two Special Sections.

It will be noted that whereas in the existing old-style type of equipments each six-circuit panel requires an ammeter and voltmeter, with this new sectional type of equipment one duplex meter can be made to suffice for 36 circuits, or in the case of the meter shown on the panel where it is illuminated it probably could handle 42 circuits, it simply being a matter of distance, at which the meter scale is easily read.

Fig. 4 shows a 12-circuit equipment arranged for three-wire service. The two lower sections, however, are of larger capacity, the rating being 180 amperes. From the construction of the two different capacity sections it will be seen that the only difference is in the contacts, the 90-ampere being of the double-button type and the 180-

ampere of the double-copper-segment type. The slate panels, however, are both the same size, the grid supports being identical in construction. They therefore fit into the same frame, and the high-capacity section can be interchanged with a lower capacity section and vice versa.

Fig. 5 shows a 41-circuit equipment which is of particular interest.

Each charging section is standard in construction, as shown in Fig. 1, with this exception, that on the tail of the low-current circuit breaker there is fastened a silver-tipped bronze spring that makes contact with a spring post when the circuit-breaker is

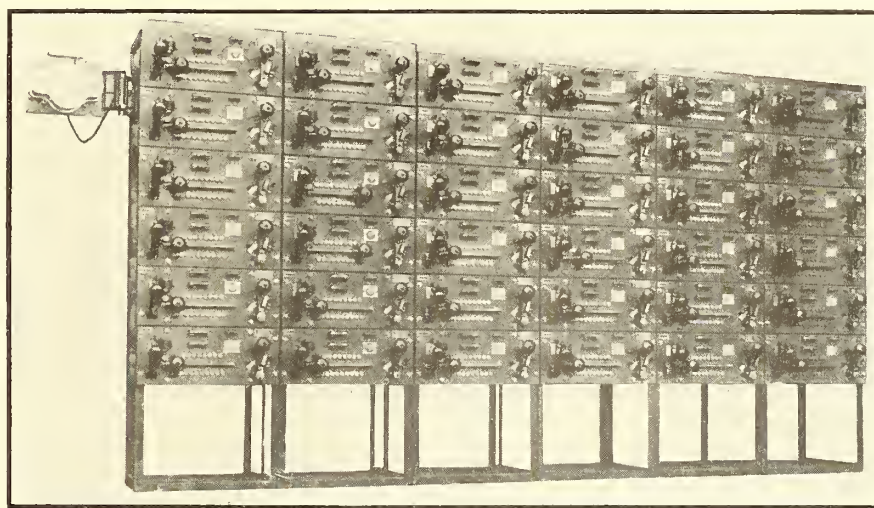


Fig. 5.—41-Section Charging Board in Service.

open. By referring to the illustration note should be made that on the upper slate section on the extreme left-hand panel there are mounted two Schwarze high-tension bells designed to operate on the regular 115-volt circuit used for all other purposes.

If for any reason when a battery is on charge the line voltage should fail entirely or fall below that of the battery so as to cause the current to reverse in the circuit, the circuit-breaker will drop out and, through the contact springs just mentioned, complete the circuit to the bell, calling the attention of the operator to the fact that the breaker is open. This particular equipment was built for a contractor in New York, engaged in hauling United States mail.

Fig. 6 shows the detail section of a 90-section equipment recently installed. Each slate section mounts two low-current circuit breakers and pilot lights as used on the standard sections, also two special double-pole single-throw knife switches with patented meter-reading clips. There are also furnished two single-pole single-throw resistance-shortening switches. The operation is as follows: When the battery has been plugged on to the panel, the double-pole switch is closed so that it engages the two meter-reading clips nearest to the switch hinge, the single-pole switch being opened. The open-circuit voltage, therefore, is recorded on the voltmeter; now by closing the circuit-breaker and closing the knife switch in a little further so that it makes contact not only with the two meter-reading clips, but also with one of the switch posts, one of which is higher than the other, the closed-circuit counter voltage of the battery is recorded as well as the charging current flowing through the battery. Closing the switch all the way allows the switch blades to slip past the meter clips cutting the ammeter and voltmeter out of circuit without causing an arc. In other words, this knife switch functions exactly the same as the standard meter switch previously described.

Exide Guarantees Batteries to Ohio Electric

Karl Kuhlman, the engineer in charge of electrical research for the Ohio Electric Car Company, has completed a series of exhaustive tests covering storage batteries for car propulsion.

"These tests," says Mr. Kuhlman, "have extended over a period of two years and have included almost every known storage battery.

"The results have justified the Ohio in continuing to use the Exide Hycap batteries as standard equipment.

"The price of these batteries is higher than others, yet the superior qualities make them the only battery suitable for a high grade car.

"One of the officials of the Ohio company recently visited the plant of the Electric Storage Battery Company, Philadelphia, and was so impressed with the extraordinary attention paid to the minutest detail in the construction and assembly of these batteries that arrangements were made whereby the Exide company assumed direct supervision of the Ohio Electric Com-

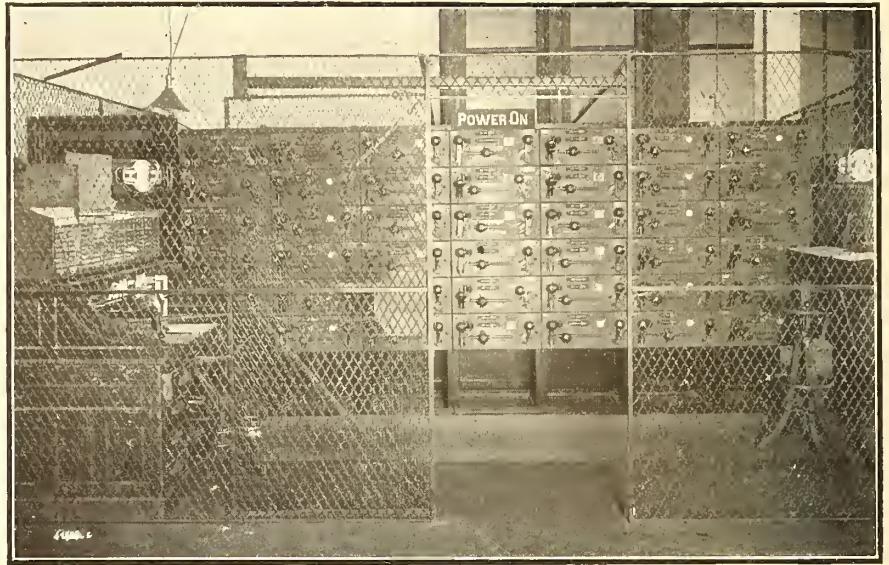


Fig. 6.—Detail of 90-Section Equipment Recently Installed.

pany's battery plant in its big factory at Toledo.

"As a result of these arrangements the Electric Storage Battery Company now guarantees fully every new battery turned out of the Ohio plant, and this is the first instance in which the Electric Storage Battery Company has been willing to give its own warranty on electric storage batteries not completely made in its own plant."

New England Electric Vehicle Men Dine

The uses of electric vehicles in modern systems of transportation were discussed by the New England section of the Electrical Vehicle Association of America at a dinner in the Thorndike November 30.

The dinner was held in connection with electrical prosperity week. The speakers were E. S. Mansfield of the Edison Company, Charles H. Miles, Day Baker of the General Vehicle Company of New York, and S. G. Thompson of the Public Service Commission of New Jersey.

A parade of 96 electric vehicles used in various industries started from Arlington street and, after passing through the business section of the city, disbanded on Atlantic avenue.

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Per Ed J. Mock, President.

Sworn to and subscribed before me this 30th day of September, 1915.
(Seal) LEONA J. ECKSTROM.

My commission expires Aug. 17, 1918.

Comparative Performance

Operating Statistics and Data of Gasoline and Electric Vehicles in Similar Service

ONE of the many favorable arguments advanced by the electric vehicle salesman in his efforts to combat the more popular gasoline machine has been that in its field of application this type of vehicle can accomplish practically as much in a day as can the higher speed gasoline machine, and do so at a less cost.

This paper is compiled with the purpose of developing this statement from one of theoretical assumption to one of scientific fact substantiated by practical demonstration; and to do this clearly, recourse to several charts has been made, which not only makes for brevity in the paper itself but has the advantage of concise presentation.

In pursuing this argument several factors must first be ascertained, and their relation to the subject as a whole weighed to determine all the contributory causes for the existence of the belief at all. Of these factors the important ones are:

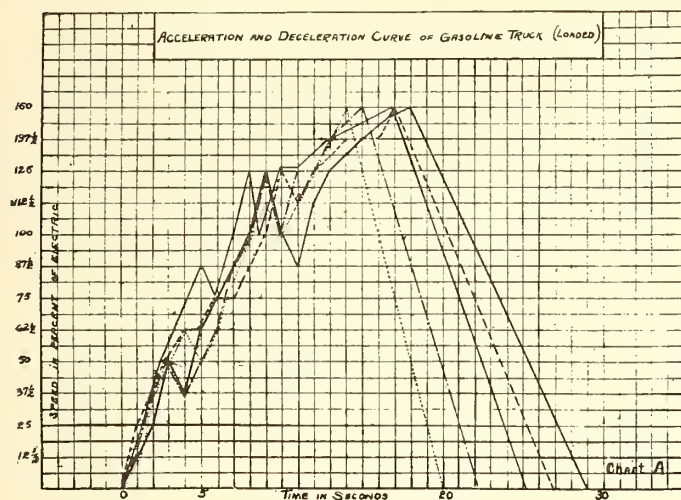


Chart A.

- (1) The speed of acceleration and of deceleration of the gasoline machine;
- (2) The speed of acceleration and of deceleration of the electric machine;
- (3) The probable frequency of stops expressed in stops per mile;
- (4) The effect of other traffic on the highway as it relates to stops and speeds;
- (5) The total time available for running the vehicle.

This last is so important that it might be the determining factor in deciding whether to use power wagons at all, because with a relatively high standing time the advantages of power wagon operation over those of horse-drawn vehicles entirely disappear, as the proportion of the day when the machine is running is insufficient to make an appreciable reduction in the total running time; hence the machine can do no more work.

Now, returning to the several factors bearing upon the subject in hand, the first two, relative to the speed of acceleration and deceleration of the gasoline and

electric machines, are diagrammatically represented in Charts A, B, and C, while the values of the other factors enumerated are to be found in Table D, all of which may be severally described as follows:

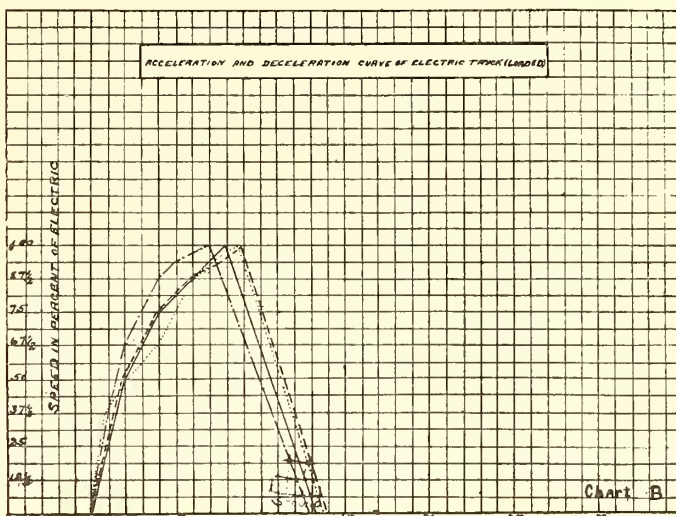


Chart B.

Chart A and B are respectively plottings of a series of observations on the acceleration and deceleration of gasoline and electric trucks of equal load capacity and quality made under identical operating conditions, the gasoline vehicle, however, having a speed capacity of 50 per cent in excess of that of the electric.

Chart C is a combined curve of the means of the plottings on Charts A and B.

It will be observed that in each instance the deceleration curves contained in Charts A, B, and C are rep-

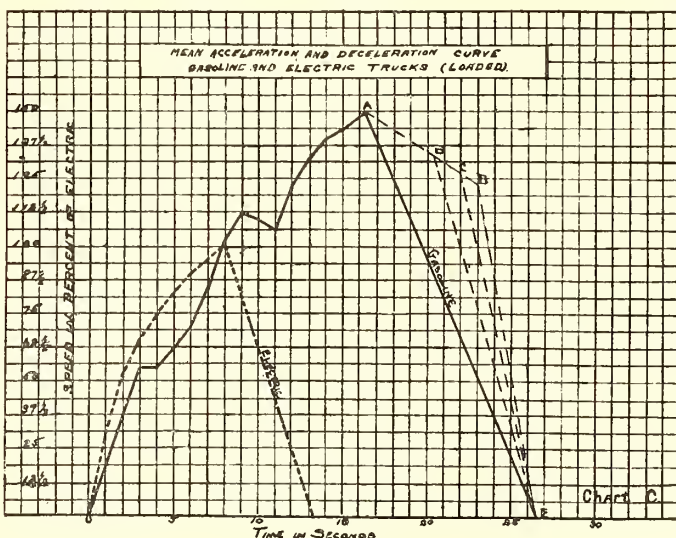


Chart C.

resented as straight lines. This is because the time of coasting and the time of braking are variables depending entirely upon the whim of the driver; therefore the observations account for only the actual period elapsing

from the time the power was first shut off until the vehicle came to a standstill. Were the braking and coasting times considered, the deceleration curves might be represented by any one of the curves A B E, A C E or A D E, as indicated on Chart C.

Chart C indicates the comparative acceleration of the two types of machines. It will be observed that for the first eight seconds of acceleration the speed of the electric machine exceeds that of the gasoline, at which time it has reached its maximum, and that the acceleration of the gasoline machine to a speed 50 per cent higher than that attained at this point requires practically the same time in seconds, the elapsed time, speeds in M. P. H. and distance traveled for each type of machine being as follows:

Elapsed time in seconds	Speed M.P.H.		Total distance traveled (ft.)	
	Gas	Elec.	Gas	Elec.
1.....	1.5	2.5	1.10	1.84
2.....	2.0	4.2	4.40	6.98
3.....	4.4	5.4	10.03	14.33
4.....	4.4	6.0	16.79	22.78
5.....	5.0	6.6	23.84	32.04
6.....	5.6	7.2	31.63	42.33
7.....	6.8	7.6	40.59	53.35
8.....	8.4	8.0	51.61	64.81
9.....	9.0	—	64.39	—
10.....	8.8	—	77.43	—
11.....	8.5	—	90.10	—
12.....	9.6	—	103.51	—
13.....	10.6	—	118.79	—
14.....	11.2	—	134.96	—
15.....	11.5	—	151.79	—
16.....	11.8	—	168.91	—
16 2-5.....	12.0	—	186.50	—

Table D is a record of a series of observations on a delivery service in a city of 750,000 inhabitants and the surrounding towns, operating within a radius of 15 miles of the business center.

For purposes of segregation the statistics are charted in zones according to the mean distance from the delivery route to the store. The mean distance is one-half the sum of the distance from the store to the first delivery stop and from the last delivery stop returning to the store. The characteristics of the zones may be given as follows:

Zone 1—Business and city residential apartment house sections;

Zone 2—Residential apartment houses and flat sections;

Zone 3—3-apartment flat sections and private houses;

Zone 4—Private houses in suburban towns.

This Table D requires close analysis, as in it is contained the factors controlling the operation of a delivery system and limiting the movement of the vehicles employed.

These important contributory factors are enumerated in the title heads of the table, and establish the following:

(1) Probable average stops per mile:

Zone 1.....6 Zone 3.....5

Zone 2.....7 Zone 4.....4

(2) Time elements in proportion to the total time consumed, as follows:

Time running on route...29.86 per cent.

Time running off route...17.76 per cent.

Time delivering28.18 per cent.

Time loading24.20 per cent.

(3) Relative values of the "miles off route" and the "miles on route" 36 per cent and 64 per cent respectively.

With all of this accumulated data, we have established the factors affecting the speed of movement as

it relates to the total day's work performance of gasoline or electric machine, and by applying these to the different zones the efficiency of the two types of vehicles may be determined. Therefore, if we resolve all these factors to a comparative basis we will find that for equal work performance the gasoline machine will but slightly excel the electric, which difference is of little consequence when the time-saving effected is properly segregated into the different time elements of a 9-hour day. For example, on the basis of the calcu-

TABLE D.

Mean Distance to Route	No. of Stops	Miles on Route	Miles Off Route		Approx. Stops per Mile on Route	Time Factors								
			Out	In		Running		Delivery, Min.	Load, Min	Min.				
						On Route Min.	Off Route Min.			Total	Hour			
Zone 1	0.4	9	1.0	0.5	0.3	9.0	9.5	6.5	19.0	35	1	10		
	0.45	20	4.3	0.6	0.3	5.0	42.0	14.0	39.0	34	2	9		
	0.45	29	6.1	0.7	0.2	4.9	42.0	15.0	32.0	43	2	12		
	0.5	23	4.3	0.7	0.4	5.0	35.0	15.0	46.0	53	2	29		
	0.6	25	3.3	0.7	0.6	8.0	41.5	10.0	26.5	31	1	49		
	0.6	21	3.75	0.6	0.6	6.0	27.0	9.0	34.0	69	2	30		
	0.6	7	2.1	0.8	0.4	3.0	11.0	6.0	7.0	6	1	19		
	0.7	11	2.5	1.1	0.4	4.4	18.0	18.0	18.0	50	1	44		
	0.8	17	3.4	1.1	0.5	5.0	23.0	17.0	31.0	43	1	54		
	0.85	24	3.1	1.1	0.6	8.0	38.0	23.0	48.0	38	2	27		
0.9	36	3.9	0.4	1.4	9.0	34.0	13.0	57.0	47	2	31			
Zone 2	1.0	16	3.5	1.8	0.2	4.5	32.0	13.0	13.0	46	1	44		
	1.0	50	8.0	1.0	1.0	6.0	93.0	35.0	111.0	30	4	29		
	1.0	23	3.5	1.5	0.6	7.0	27.0	23.0	77.0	29	2	36		
	1.1	40	9.0	1.0	1.3	4.5	76.0	34.0	46.0	64	3	40		
	1.1	45	7.3	1.1	1.2	6.0	68.0	24.0	48.0	65	3	25		
	1.1	22	3.3	1.5	0.8	6.6	25.0	18.0	33.0	44	2	2		
	1.1	25	2.2	1.1	1.2	11.0	27.0	24.0	48.0	44	2	23		
	1.1	21	3.8	0.9	1.4	5.5	34.0	15.0	39.0	34	2	02		
	1.1	20	4.0	1.7	0.6	5.0	38.0	21.0	57.0	58	2	54		
	1.4	37	5.9	1.1	1.7	6.0	55.0	31.0	55.0	49	3	10		
1.6	26	5.1	0.7	2.5	5.0	28.0	31.0	41.0	46	2	26			
1.7	46	7.7	1.9	1.6	6.0	72.0	33.0	56.0	34	3	15			
1.7	30	2.4	1.6	1.8	12.5	25.0	26.0	39.0	44	2	14			
1.8	71	20.6	1.9	1.8	3.5	181.0	98.0	142.0	22	7	23			
1.9	35	3.7	3.2	0.7	9.3	30.0	27.0	43.0	52	2	32			
1.9	43	7.4	2.2	1.7	6.0	62.0	36.0	64.0	83	4	05			
1.9	42	7.0	2.2	1.7	6.0	59.0	34.0	85.0	77	4	15			
Zone 3	2.0	31	8.0	1.9	2.1	4.0	64.0	38.0	34.0	25	2	41		
	2.0	24	8.5	3.1	1.0	3.0	86.0	39.0	79.0	42	4	06		
	2.1	51	12.2	1.7	2.5	4.0	117.0	50.0	142.0	125	7	14		
	2.1	32	4.9	2.2	2.0	7.0	39.0	43.0	55.0	40	2	57		
	2.1	51	11.3	2.0	2.2	4.4	97.0	30.0	87.0	48	4	22		
	2.2	40	5.6	2.0	2.5	8.0	53.0	46.0	52.0	59	3	30		
2.6	27	4.2	2.3	2.8	6.5	40.0	45.0	34.0	19	2	18			
Zone 4	2.9	59	10.8	2.6	3.3	5.0	92.0	50.0	81.0	34	4	17		
	3.0	29	4.5	2.1	3.9	7.0	55.0	47.0	34.0	51	3	07		
	3.25	27	7.7	3.3	3.2	3.5	68.0	53.0	45.0	30	3	16		
	3.3	43	8.2	3.3	3.3	5.2	80.0	59.0	51.0	60	4	10		
	3.4	44	9.1	3.3	3.4	4.8	80.0	54.0	58.0	58	4	10		
	3.7	26	5.3	3.6	3.8	5.0	50.0	58.0	36.0	77	3	41		
	6.8	67	25.1	6.8	6.9	2.6	183.0	91.6	136.0	35	7	25		
	8.5	53	19.6	7.2	9.9	2.7	131.0	108.0	69.0	43	5	51		
1418						287.15	82.1	80.3	2488.0	1480.5	2347.5	2016	138	52

lations in Table D, the time elements in a 9-hour day would be as follows:

Time running on route...2 hrs. 41 min.

Time running off route...1 hr. 36 min.

Time delivering2 hrs. 32 min.

Time loading2 hrs. 11 min.

Of these only the first two are affected by the relative speeds of the machines, the first being partially governed by the frequency of stops and the second by the speed capacity of the machine.

On an average basis of six stops per mile and a daily work performance equal to that possible with the electric vehicle, deductions based upon the facts as presented in Charts A, B, C, and Table D would determine the daily saving of gasoline machine over electric to be 73 minutes, which for increased performance must be segregated into the time elements as follows:

Time running on route....21.80 minutes

Time running off route....12.96 minutes

Time delivering20.57 minutes

Time loading17.67 minutes

Hartford Battery Exchange System

*Data on Central Station's Experience with Battery Exchange System for Commercial Vehicles**

IN THE old days of the Electric Vehicle Company, as far back as 1900, the Hartford Electric Light Company purchased and used a number of electric vehicles, both commercial and passenger. There has been no time since when this company has been without some electric vehicles of each of these classes.

The original equipment of commercial vehicles were of the Riker construction, some six in number, and each vehicle known by some nickname. One truck as the "Yellow Wagon"; another as the "Black Wagon"; two "Peanut Wagons"; and a 2-ton Riker, known as "Maggie." This 2-ton Riker was the most satisfactory of any of the earlier vehicles, and was in continuous use by the company from February, 1901, when purchased, for twelve and one-half years, handling freight and stock room work. The company's battery experience is even longer than its vehicle experience, dating back to 1896.

LIGHTING COMPANY AS AGENTS.

During the period up to 1910, passenger electric vehicles were represented by a number of agents and many placed in use. As a rule, these same agents represented commercial electric vehicles also, but made no effort to sell them and had no information at their disposal which would assist them in doing so. The Hartford Electric Light Company decided that the commercial electrics would never be fairly represented in this way. The company decided to take the agency for a commercial electric and considered that the best results would be obtained by confining this agency to one make of vehicle only. The company, therefore, took the agency for General Vehicle Company trucks early in the year 1910 and purchased three trucks, one of 1,000-pound capacity and two of the 1-ton size, which were received in July, 1910. One 1-ton car was placed in the hands of the vehicle department for demonstrations which were made without charge wherever possible.

The Boston Branch Grocery was the first customer to buy an electric truck. Their first vehicle was the 1,000-pound size, with panel body, and went into service on November 1, 1910. This car is still giving most satisfactory service and has covered 46,760 miles up to August 1, 1915. The Boston Branch Grocery is now the largest user of electric trucks in Hartford, with eleven G. V.'s, all of the 1,000-pound and 1-ton sizes, which have replaced all the original equipment containing both horses and gas cars.

Before battery service became the decisive advantage, the Hartford Electric Light Company furnished free garage and charging current for a period of six months on all new cars. Fourteen trucks were sold up to December, 1911, all equipped with standard lead batteries and operated in the usual way. These vehicles proved most satisfactory. It was found, however, difficult to cover the necessary routes with snow on the ground or other unfavorable conditions and two batteries were used in some of these vehicles during the winter of 1911-12. These batteries were handled in the individual trays and exchanges made in less than ten minutes.

The first outline of battery service is contained in the following letter, five hundred copies of which were

BY WILLIS M. THAYER

sent to Hartford firms on November 1, 1911. The letter appeared as follows:

Gentlemen:

Hartford, Conn., Nov. 1, 1911.

Another striking advantage offered users of General Vehicle Company electric wagons, by the Hartford Electric Light Company is continuous battery service. You can contract with us to furnish battery service for your General Vehicle Company trucks for any mileage. One hundred miles, per day, offers no difficulty.

The price of this unlimited service is based on the mileage, and with charging current included is no greater than the charging current alone for the limited service given with some other types of batteries.

Your truck can be kept on your own premises and no provision made for charging. You are entirely relieved from any responsibility or care of batteries.

This letter continues with further data on electric vehicles and is signed, The Hartford Electric Light Company.

The plans for putting this "service" into practical operation were completed early in 1912.

The Eagle Dye Works Company purchased the first car for operation under this system. This car was delivered and went to work on June 5, 1912. All cars previously sold were changed over for operation under the "service" as rapidly as possible. The following is a list of the cars at each period of six months with the miles traveled that month and total miles traveled to date.

JUNE, 1910.	
Number of trucks in use.....	3
Miles for month.....	272
Total miles to date.....	272
DECEMBER, 1910.	
Number of trucks in use.....	5
Miles for month.....	3,196
Total miles to date.....	15,573
JUNE, 1911.	
Number of trucks in use.....	6
Miles for month.....	2,915
Total miles to date.....	31,396
DECEMBER, 1911.	
Number of trucks in use.....	14
Miles for month.....	3,639
Total miles to date.....	32,137
JUNE, 1912.	
Number of trucks in use.....	18
Miles for month.....	11,757
Total miles to date.....	138,925
DECEMBER, 1912.	
Number of trucks in use.....	30
Miles for month.....	15,207
Total miles to date.....	218,894
JUNE, 1913.	
Number of trucks in use.....	32
Miles for month.....	24,873
Total miles to date.....	347,636
DECEMBER, 1913.	
Number of trucks in use.....	46
Miles for month.....	32,751
Total miles to date.....	574,900
JUNE, 1914.	
Number of trucks in use.....	50
Miles for month.....	38,614
Total miles to date.....	727,345
DECEMBER, 1914.	
Number of trucks in use.....	58
Miles for month.....	40,787
Total miles to date.....	978,526
JUNE, 1915.	
Number of trucks in use.....	64
Miles for month.....	47,615
Total miles to date.....	1,232,967

EQUIPMENT FOR BATTERY SERVICE.

The customer purchases trucks without batteries under the Battery Service System, as developed by the Hartford Electric Light Company. The company buys the batteries, charges and installs them in the customers' trucks. The equipment required by the company consists of batteries, the means for charging the batteries, and the apparatus for placing the batteries in the customers' trucks. The odometers on the trucks are also a part of the company equipment, with the cradles for the extra batteries. The "service" may be divided into two parts: the charging of batteries in cars at night and the charging of batteries out of cars. All charging of batteries is done at the garage of the Commercial Electric Company, 1271 Main street, where the company has installed charging equipment consisting of a Rotary converter, having a capacity of 850 amperes at 250 volts, and a motor generator set, having a capacity of 800 amperes at 250 volts. Both of these machines are designed for operating on the three-wire system. This equipment is operated by employees of the company from 11 p. m. to 7 a. m. The arrangement of rheostats, etc., is the same as described later under the exchange station equipment.

All batteries not charged in the cars are handled at the State street station. This station is in the direct current zone, and an ample supply of power available at 110-220 d. c. There are thirty-one sets of charging equipment installed. Each set is made up of one ammeter, one Sangamo ampere hour meter, one circuit breaker, and one switch. All batteries used on the "service" are Edison batteries of the standard size, recommended by G. V. Co. for the different sizes of trucks and all the trucks on the "service" are G. V.s, equipped with Universal cradles.

The Universal cradle is a underslung battery container, secured to the car by four hooks, one at each corner, and is removable in one unit by raising the battery about 2 inches, removing the hooks and detaching the battery leads. The vehicles are run into guides over hydraulic lifts for the purpose of removing the batteries. The hydraulic lift is made up of four cylinders, one at each corner of the platform, 3 feet by 6 feet. This platform in the lowered position is even with the floor. Each of these cylinders has an inside diameter of 6 inches and a maximum lift of 10 inches. Each cylinder is connected to the city mains by a 1-inch pipe. The opening of one valve of the city mains, places a water pressure of 60 pounds on each of these cylinders, which has proved ample to raise any batteries in use. The same pipe used for supplying the water to the lifts as is also used for discharging the water and lowering. This is done by closing the valve on the city main, and opening a valve on the discharge main. The original equipment contained a plunger valve on each of the four pipe lines to the cylinders. These valves have proved of small value. Each cylinder lifts the battery gradually into contact with the frame of the truck and automatically adjusts itself to varying heights of the truck frame from the ground, caused by worn tires or poorly distributed load.

Some form of platform truck is necessary for handling batteries when disconnected from cars. The Cowen truck used for this purpose has a height of 7 inches and is equipped with a platform which may be raised or lowered 1½ inches by the handle of the truck. The Cowen truck is placed on the platform of the hydraulic lift under the car from which the battery is to be removed. The hydraulic lift raises the Cowen truck into contact with

the battery cradle and raises the whole equipment high enough to permit the removal of the hooks which secure battery to body of car. When hooks are removed and wires detached, the battery is lowered and removed on the Cowen truck to the charging room. The raised platform of the Cowen truck allows the battery to be run over skids in the charging room. The battery is then lowered on to the skids and the truck removed for other work. The exchange station is equipped with two complete hydraulic outfits for exchanging batteries. A single equipment is capable of making the complete exchange of battery in three minutes, or less.

CHARGING METHODS.

No instruments are used on the cars except odometers. All battery charging is based on the mileage covered with allowance for road conditions. When battery is removed from car the odometer reading is taken. The previous reading gives the miles covered and a slip is placed on the battery showing this distance. The man who places the batteries on charge uses this distance as the basis, multiplying same by a certain constant, depending on road condition, size of truck, etc. The Sangamo meter is set at the number of ampere hours required and runs back to zero, where the circuit breaker cuts it out. The voltage on individual cells is followed during the charging and serves as a check on the ampere hour meter.

Some power is saved in this way. The Sangamo meter, however, is practical and accurate, and is certain to take the battery off charge before excessive charging occurs. Batteries are cleaned with live steam at a pressure of 10 or 15 pounds. Distilled water is obtained from Barnstead water stills, operated electrically.

OPERATING DATA.

The introduction of "battery service" has tended to increase the mileage covered. The Boston Branch Grocery has a 1,000-pound car in use for 56 months, and has covered 46,760 miles, an average of 835 miles per month. The mileage of this car for July, 1915, was 1,012. C. N. Dodge has had a 750-pound car in service 46 months, and has covered 42,796 miles, an average of 930 miles per month. The miles covered by this car for July, 1915, were 1,293. The Eagle Dye Works Company has operated a worm drive car for 9 months, and has covered 10,782 miles, an average of 1,198 miles per month. The mileage of this car for July, 1915, was 1,313. One of Gaffey's Express 1-ton cars has been in service 32 months and has covered 35,032 miles, an average of 1,095 miles per month. The mileage of this car for July, 1915, was 1,251. The City Coal Company has operated a 2-ton truck for 8 months and has covered 7,998 miles, an average of 1,000 miles per month. This truck covered 1,110 miles in July. One of the first 1-ton cars received by the Hartford Electric Light Company has been in service 62 months and has covered 50,844 miles, an average of 820 miles per month. The mileage in July, 1915, was 1,031.

The record of cars and batteries for June, 1915, stands:

No. of cars	Size	Batteries	Ratio
11	750-lb.	17	1.54
22	1,000-lb.	34	1.54
28	1-ton	33	1.18
3	2-ton	5	1.67
—	—	—	—
Total, 64		89	1.4

During the month of December, 1914, cars on the road represented 1,432 car days, 1,284 exchanges of batteries were made, or 90 per cent. of the cars changed

batteries every day. The number of cars stalled for any cause whatever was one for every 50 car days, that is, one car would get into difficulty every 1,450 miles.

During the month of June, 1915, cars on the road represented 1,594 car days, 988 exchanges of batteries were made, or about 64 per cent. of the cars changed batteries every day. The number of cars stalled for any cause whatever was one car for every 477 car days, or the average car would get into difficulties once in every 14,310 miles. Twenty-four per cent. of the cars do not charge at night. The record of stalled cars includes every cause whatever, and does not necessarily imply exhausted batteries. An inexperienced driver might run his truck over into a back lot or over a bank.

The power used is measured by watt meters and includes all losses in transformation and stepping down.

For December, 1914:

Total power consumed was 57,856 kilowatt hours.

The mileage covered, 40,787.

The average power used, per mile, 1,418 watts.

For June, 1915:

Total power consumed was 50,414 kilowatt hours.

The total mileage covered, 47,615.

The average power used, per mile, 1,058 watts.

The Edison batteries used on the "service" are in some ways subjected to very hard use. The total number of cells in use at the end of the first period of three years, 5,094, and their service was the equivalent of 113,850 cell months. Seventy-six cells have been returned to the factory for repairs in these three years. Forty-four on account of leaks or broken seams. The balance of 32 cells for other causes, such as failure to charge up or broken terminals.

COST RECORDING.

The accounts assigned to the vehicle and battery departments are arranged under the same general plan as all other company accounts.

The main accounts are carried under numbers and these accounts divided into sub-accounts, indicated by the main number, with—and sub-number. For instance, operating account is known as number 69, while operating labor under this account is 69—1. The accounts under battery service are divided as follows: The property account covering purchase of batteries; the property account covering purchase of service apparatus.

The operating accounts for the "service" are:

Operating Labor.—This account includes labor for exchange of batteries, filling, charging, changing solution and shift labor covering the whole twenty-four hours of each day.

Operating Material.—Includes distilled water, solution and any other material used directly for the batteries.

Repair Labor.—The labor for actual repairs to batteries.

Repair Material.—Any parts for repairs to batteries or any repairs made at factory.

Repair Service Apparatus.—Includes labor and material for repairs to charging sets, extra Universal cradles, Odometers, Cowen trucks and all other apparatus used in handling batteries.

	1st year June, 1912, to June, 1913	2nd year June, 1913, to June, 1914	3rd year June, 1914 to June, 1915	3-year total
Battery service				
Operating labor	\$2,775.85	\$ 9,381.16	\$ 8,727.70	\$20,884.71
Operating material..	467.37	1,221.85	1,286.61	2,975.83
Repair labor		2.94	29.84	32.78

Repair material	76.94	102.42	313.71	493.07
Repair service apparatus	7.10	892.62	1,161.15	2,060.87
Power	520.33	1,904.83	2,833.37	5,258.53
Total of operating items	3,847.59	13,505.82	14,352.38	31,705.79
Income	5,543.88	18,559.07	26,559.13	50,662.08
2,568 cells in use at end of first year, equal to cell months				13,332
4,128 cells in use at end of second year, equal to cell months				43,536
5,094 cells in use at end of third year, equal to cell months				56,982
cells in use at end of 3-year period, equal to cell months				113,850

	1st year June, 1912, to June, 1913	2nd year June, 1913, to June, 1914	3rd year June, 1914 to June, 1915	3-year total
Operating labor	\$0.2082	\$0.2155	\$0.1531	\$0.1834
Operating material	0.0350	0.0280	0.0226	0.0261
Repair labor	0.0000	0.0002	0.0068	0.0029
Repair material	0.0057	0.0023	0.0055	0.0043
Repair service apparatus.	0.0005	0.0204	0.0203	0.0181
Power	0.0390	0.0437	0.0497	0.0461
Total of operating items.	0.2885	0.3102	0.2518	0.2793
Income	0.4158	0.4263	0.4661	0.4449

ON BASIS OF PER CAR PER MONTH.

32 cars in service at end of first year, equal to car months	178
46 cars in service at end of second year, equal to car months	521
62 cars in service at end of third year, equal to car months	687
cars in service at end of 3-year period, equal to car months	1,386

	1st year June, 1912, to June, 1913	2nd year June, 1913, to June, 1914	3rd year June, 1914 to June, 1915	3 year total
Operating labor	\$15.59	\$18.006	\$12.704	\$15.068
Operating material ..	2.064	2.345	1.872	2.147
Repair labor	0.000	0.005	0.043	0.0237
Repair material	0.432	0.216	0.456	0.356
Repair service apparatus	0.039	1.713	1.690	1.496
Power	2.923	3.656	4.124	3.796
Total of operating items	21.615	25.923	20.891	22.876
Income	31.145	35.622	38.659	36.552

ON BASIS OF PER AVERAGE MILE.

121,385 miles covered at end of first year	
365,968 miles covered at end of second year	
496,621 miles covered at end of third year	
983,974 miles covered at end of three-year period.	

	1st year June, 1912, to June, 1913	2nd year June, 1913, to June, 1914	3rd year June, 1914 to June, 1915	3 year total
Operating labor	\$0.0228	\$0.026	\$0.017	\$0.021
Operating material	0.0038	0.003	0.002	0.0031
Repair labor	0.00	0.00	0.0001	0.0000
Repair material	0.0006	0.0003	0.0005	0.0005
Repair service apparatus.	0.0000	0.002	0.002	0.002
Power	0.0042	0.005	0.005	0.005
Total of operating items.	0.032	0.036	0.028	0.032
Income	0.046	0.053	0.054	0.051

FUTURE EXTENSIONS OF THE SERVICE.

Battery service would seem to overcome the weakness of electric vehicles caused by the limitations of battery capacity. This is true, but batteries with greatly increased capacity would increase the practicability of the battery service system. A local truck owner recently ran nearly down to New Haven, a round trip distance of seventy miles. On the return trip a stop was made at Meriden and the battery given a boost, for which the truck driver paid 88 cents. The truck owner afterward asked if this 88 cents was not a part of the battery service for which he had already paid. This experience brings out the possibility of an arrangement with the central stations in surrounding towns under which any of the truck users could send their trucks on long trips and get boosts wherever necessary. The charge for this service would be billed to the light company furnishing the battery service and a certain proportion of this bill charged to the customer. Should other central stations in surrounding towns adopt battery service, exchange of batteries could be made and the record handled very much as in the case of railroads using cars of foreign lines.

Two Big Changes Forecasted

Among the men who keep their ears to the ground for advance rumors of changes in the attitude of the motor car buying public there is a very decided unanimity of opinion that the next few years will see the enclosed car as the popular type of automobile and the electric-powered car as the general selection of an enclosed automobile.

Only recently a group of men, all of whom have been prominent in automobile affairs, were discussing the recent announcement by the Anderson Electric Car Company of doubled production and the \$600 to \$725 reduction in price without a single change in quality. One of them remarked, "I tell you that the easiest game to win at is to give the public what it desires. Sooner or later it gets what it wants anyway—and what it seems to want now and for the future is an electric-powered enclosed automobile. The aggressive work the Anderson Electric Car Company is doing is simply a forerunner of what the entire electric car industry will be doing before long. The average buyer of an automobile today is a pretty wise chap. He has learned that no matter how good a gas car he gets that it possesses some inherent drawbacks that cost, both in money and in annoyance. On the other hand he knows that the modern electric automobile has an absolutely smooth unbroken flow of power. That its mechanism is simple and rarely needs attention. It has big batteries that will take enough of a charge to provide a greater mileage radius than is required by 98 per cent of all motoring trips undertaken. That it has more speed than city ordinances permit. That current for battery charging is low in cost and constantly being reduced. That the electric car, free from grease and oil stains, and, best of all, that every member of the family can drive it just as expertly, easily and safely. In other words he knows that he and his family can get from twice to three times as much use from a modern electric as he can from any other type of car—and at far less expense. He knows, too, that he can use the electric every day in the year, winter and summer with equal facility and comfort. Just consider the increasing number of electric cars in use on our city streets. Probably every one of us could tell of some friend, relative, or acquaintance who has turned to the electric car as a real solution to the automobile—for his family, for all the year use."

Electric Stevedore Popular in the South

Among the many new and successful applications of electricity the electric commercial vehicle is holding its own with other "current-consuming devices." It has been recognized for some time that the chief competitor of the city horse is the electric truck, and now the vehicle manufacturer has brought out a competitor for the hand truck, which is to be seen about the freight sheds and factories.

When the electric industrial truck or "electric stevedore," as it is sometimes called, was first brought out, it was anticipated that labor unions would oppose them, but this has seldom been the case. In fact when one steamship company started to transfer a number of these trucks to another seaport, the drivers went on strike and practically obliged the company to retain them. There is a lot of difference between pushing a hand truck with a cask of oil on it, part of

the great weight of which falls on the laborer's shoulders, and in riding on and guiding a powerful little electric, which can move five casks at once. Hundreds of these electric freight trucks are used by railroad and steamship companies, manufacturing plants, etc., and indications point to the use of thousands in a few years. Most of them are of one-ton capacity with a speed of from seven to twelve miles per hour, and they cost about one cent per mile for current, even when worked hard. They can climb grades of from twenty to thirty per cent and go through narrow aisles and around sharp corners. As they carry five times as much freight as the average hand truck and go over the ground in one-third time each truck naturally does the work of about fifteen freight handlers.

Down on the lumber tramways of Louisiana the electric "mule" has made its appearance. The "mule" is nothing but an electric tractor, sufficiently powerful and elastic to take the place of the real mule at one end of a lumber dolly which moves thousands of feet of green lumber. The long tramways cost thousands of dollars in repairs each year, due to the shoes of the mules cutting into the planks. This set a big lumber man thinking about motor trucks and the electric "mule" was the result, preference being given it owing to lower fire risk, greater elasticity and the fact that electricity was already available as a by-product. Tractors of this kind are rapidly spreading through the South and Northwest.

New Electric Delivery Vehicle

That an electric car with ample mileage capacity can be built at a price within the reach of the small merchant was demonstrated officially Friday, October 29, when Herman Schmidt, president and general manager of the Eagle Electric Automobile Company, and R. T. Smith, of the General Electric Company, Detroit, made the trip to Detroit and Ypsilanti and return on one charge of the battery. On the trip the car was shown to a number of prominent people at Wayne and Ypsilanti, and the purpose of the trip was explained. Mr. Schmidt, designer of the car, is a man of broad experience in construction and design of electric cars, having spent ten years abroad in the service of two prominent German electrical companies, the Helios Electric Company of Berlin, and the Siemens Halske Electric Company of Lahmeyer. The latest production of Mr. Smith has a wheelbase of 110 inches, a tread of 56 inches, tires 32x31½ inches, of the special cushion electric type, cantilever springs, front and rear, U. S. L. 21-cell batteries, and a carrying capacity of 1,000 pounds. The normal speed is 15 miles per hour. Friends of Mr. Schmidt in Detroit congratulated him freely upon his success in producing an electric car for delivery purposes with ample mileage and at a popular price. Affidavits were given proving the correctness of the statement that this car made the round trip to Ypsilanti on a single charge.

To prevent the corroding of terminals on a storage battery, slip pieces of rubber tubing over the wires down close to the battery and seal the ends to the battery with melted paraffine.

The cold winter months are fast approaching, the time of the year when a snug, warm, ever-ready electric automobile is most appreciated by those who must get about town, no matter what the weather may be.

Electric Vehicles in Municipal Service

Presented at the Sixth Annual Convention of the Electric Vehicle Association

BY J. SLADE AND R. D. DUMONT

MUNICIPAL departments are not operated for profit but for the benefit of and at the expense of the citizens. It is not surprising that our cities should have been deliberate, to say the least, in adopting the economical mechanical method of highway transportation, leaving the initiative to be taken by private individuals or corporations to whom vehicle transportation cost is often the determining factor in the profits and losses of the business, as is notably true in the case of express companies, contractors, coal dealers, brewers, dealers in food products, department stores, etc.

Although it is unnecessary to emphasize the point in a paper presented before this association, the report issued by the Chicago Municipal Markets Commission, appointed by Mayor Harrison, is of interest as an unprejudiced confirmation.

After showing that the city consumer pays an average of \$1.90 for produce that the farmer sells for \$1.00, the commission states that it costs more to haul 100 pounds of potatoes, fruit or other farm products 5 miles from the docks to the city consumer or the retail store than to ship them by boat from Michigan to Chicago, and it costs nearly half as much (50 cents) to deliver a ton of coal from the railroad tracks to the consumer in the business district of the city as it costs to ship the coal 400 miles by rail (\$1.05) from Southern Illinois to Chicago.

It is estimated that in an area of less than 2 square miles in the heart of the city 150,000 tons of freight are hauled daily. About 1,000 teams are engaged in hauling food products, exclusive of the delivery service of the retailers, and to make a profit for their owners, single teams must earn about \$6 a day and double teams \$8. The report observes as follows:

Team hauling is decidedly antiquated, wasteful and inadequate. Because of the congestion existing in the streets of the central business district and the consequent inadequacy of the streets to afford free passage to vehicles, the average wagon truck spends about one-third of its time actively hauling commodities and two-thirds in waiting, loading, unloading and in delays to traffic.

Animal transportation is out of place and an archaic survival. Under present methods of hauling, food products are invariably exposed for hours to the heat of the sun. The motor truck as a carrier of food products assures to the consumer better food, lower prices, and a lower cost of hauling. Detailed comparisons showing the cost of hauling by horses and wagons and motor vehicles indicate that the average cost of hauling in the city by motor is 11¼ cents per ton-mile as compared with 17¾ cents by horse, a saving of 36 per cent.

The economies effected by the use of commercial vehicles having been conclusively proved over a period of years in private business, numerous municipalities under administrations desirous of operating city departments as efficiently as circumstances may permit, have recently been installing commercial vehicles to a very noticeable extent.

This paper will touch briefly on the equipment of the following classes of municipal service and will endeavor to indicate how and where the storage battery electric might be more extensively used with attendant economy in operation and maintenance: Fire department; street cleaning and refuse collection; police patrol; hospital ambulance service; board of education;

department of water supply, gas and electricity; department of public works, (Bureau of highways); government printing office.

FIRE DEPARTMENT SERVICE.

No municipal service presents such a complicated set of problems in mechanical haulage as does the fire department and yet it is the department which has been motorized, not only in large cities but in small villages as well, for a longer time and to a far greater extent than any other. All conceivable types and combinations of types of motive power and application have been used, most of them with success, and one system can not broadly claim superior advantages over another in view of the widely divergent service requirements. One community has a fire district covering many square miles; another is limited to a small area. One has excessive grades; another is comparatively level. One has heavy winter snow falls; another has a semi-tropical climate. One has high pressure pumping stations for its fire mains; another has not. One has many sky scrapers, district where hazardous manufacturing is carried on, densely populated tenement districts of non-fireproof character; another has entirely different types of business and residential sections.

These variations from any standard which one may choose to assume, as may be done in the case of commercial merchandise transportation problems, necessitate the wide variations in type of apparatus and motive power which we actually find in use.

To intelligently determine on a motor propelled fire equipment, the existing local conditions must be investigated and analyzed, the existing horse-drawn equipment must be considered with reference to its utilization, and the organization of the department must be studied in its relation to the operation of the mechanical apparatus.

Among the varying conditions, instances are found where electric equipment has been installed and is giving satisfactory and economical service, notably the Philadelphia and Baltimore fire apparatus described in the paper presented by Mr. Walker at the 1914 E. V. A. convention and the Springfield apparatus described in the discussion of that paper. Some recent figures furnished by the Philadelphia fire department on engine No. 20 both horse operated and electrically operated are as follows:

HORSE-DRAWN APPARATUS.

Engine No. 20, cost for 2 years.	
2 horses	\$ 400.00
Forage	553.60
Shoeing	240.00
Depreciation	940.00
Repairs	600.00
Harness	96.00
Total	\$2,829.60
Per year	1,414.80

MOTOR-DRIVEN APPARATUS.

Same engine, electrically motor-driven maintenance for 2 years.	
Current	\$1,200.00
Repairs	480.00
Depreciation	922.40
Total	\$2,602.40
Per year	1,301.20

The actual saving in cost of electric over horse operation appears to be only about 8 per cent but its speed is nearly 300 per cent greater a feature of vital importance in fire apparatus.

New York has a similarly equipped engine—No. 217—operating in the Borough of Brooklyn. The cost figures furnished by the New York fire department follow:

ENGINE NO. 217. N. Y. C. F. D., BOROUGH OF BROOKLYN.	
First year, May, 1912-May, 1913.	
Investment	\$4,000.00
Depreciation at 5 per cent.....	\$200.00
Battery—Mechanical repairs and renewals..	70.84
Current	252.48
	\$ 388.74
Second year, May, 1913-May, 1914.	
Depreciation at 5 per cent.....	\$200.00
Current	117.84
Battery renewals and repairs.....	410.97
Mechanical and tire repairs and renewals..	252.48
	981.29
Third year, May, 1914-May, 1915.	
Depreciation at 5 per cent.....	\$200.00
Battery and mechanical repairs and renewals	108.64
Tire renewals	509.57
Current	117.84
	936.05
Total—3 years	\$2,306.08
Per year	768.70
The corresponding cost with horse operation (from article by Fire Commissioner Adamson, <i>Power Wagon</i> , February 1, 1915).	
Depreciation	\$150.00
Forage, veterinary, shoeing, etc.....	750.00
	\$900.00

The actual money saving here is nearly 15 per cent without considering other advantages.

As an indication of what service this engine is called upon to perform the following number of fire alarms responded to are given:

From Apr. 24 to Dec. 31, 1912, 222 calls.
From Jan. 1 to Dec. 31, 1913, 285 calls.
From Jan. 1 to Dec. 31, 1914, 271 calls.
From Jan. 1 to June 30, 1915, 137 calls.
Average run, $\frac{3}{4}$ of a mile.
Time from tap of gong to crossing of engine house door sill..... 4 seconds
Horse-drawn engine
Gasoline tractor

The electric and the gasoline are reported to reach the alarm box in the same time on account of the higher running speed of the gasoline vehicle and this illustrates the necessity of knowing the service conditions thoroughly (average distances to be covered, traffic conditions, etc.), in order to select equipment which will arrive at the scene of the fire in the shortest time.

The report of the Electric Vehicle Committee of the Incorporated Municipal Electrical Association (of England) presented by its Hon. Secretary F. Ayton M. I. E. E. under date of June 17, 1915, refers to the equipment of "the London fire brigade which possesses a total of 15 electrically propelled vehicles, the oldest having been put into commission in 1911." Lieutenant Commander Sladen R. N. chief officer of the London Fire Brigade is quoted as follows:

The rapidity of turn out is absolutely unequaled by any other form of traction; it is not uncommon at an electric motor fire station under ordinary service conditions for a turn out to be effected in 7 or 8 seconds, whereas with other forms of motors a good turn out is perhaps 15 seconds.

He gives some figures in regard to comparative costs of electric and petrol vehicles showing that for 800 miles annually the gasoline machine cost \$990.00 and the electric \$942.00. The Liverpool Brigade has four electric vehicles in use since 1907, and among several continental

cities employing electrics one (not named but probably Berlin) has 24 in service.

Many fire departments have a varying amount of general transportation work resembling closely ordinary commercial service, such as fuel supply to steam pumping engines, delivery of department materials and supplies or the work of the fire alarm telegraph bureau. The mileage of vehicles used for these purposes is within the safe operating mileage of the electric and the advisability of operating gasoline machines in such service as is now done in some departments may be questioned, on the ground of operating economy.

STREET CLEANING AND REFUSE COLLECTION.

The use of motor vehicles and especially electrics in street cleaning operations has not yet become general, in fact may be considered to be in an experimental stage. The usual mechanical methods employed for cleaning streets are sweeping with rotary broom behind a water sprinkler to lay the dust; scrubbing with a rotary rubber squeegee in connection with a liberal water supply from a sprinkling tank which is a component part of the apparatus; flushing at 30 to 40 pounds water pressure from a tank supply, the nozzle pressure being obtained by a power driven pump, though in some instances a tank pressure is obtained when filling from the hydrants if the pressure in the water mains is sufficient. It is with this latter system that the limited number of electric street cleaners in North America have been equipped, and Canada probably has as many such vehicles as the United States. Few figures of operating cost are available, but it is obvious that as the duty of these electric vehicles is merely to transport gradually diminishing loads of water, the economy is as great as that of any merchandise carrying electric for similar mileages. The time of filling is practically the same as discharging so that at 10 miles per hour during an 8 hour day a battery capacity of 40 miles per charge is all that is required. The use of a power driven pump would require a duplicate battery equipment with means for quick interchange as a discharge of 300 gallons per minute at 40 pounds would require about 10 horse-power allowing 50 per cent combined efficiency of motor and pump, or 30 kilowatt hours extra battery capacity. With adequate facilities for recharging, boosting and interchanging batteries of various capacities so that weather, grade and pavement conditions can be compensated for it is not at all impossible that certain municipalities might find such a system very advantageous not only for flushing, but for sweeping and scrubbing, as well as for other operations.

Robert Mackay, Superintendent of Electric Light, City of Calgary, Canada, supplies the following figures on trucks in municipal service in that city:

Capacity tons	1	1	3	3	5	5	5	1
Cost to date	1933.03	1955.85	2468.76	2417.52	2997.29	3033.54	2564.58	885.59
Average per month...	214.78	217.32	274.31	268.61	233.03	337.06	284.95	177.12
Total miles...	7,176	7,061	5,080	5,375	4,581	5,855	5,208	1,475
Numbers in service...	9	9	9	9	9	9	9	9
Cost per mile	0.2692	0.2769	0.4860	0.4516	0.6542	0.5011	0.4924	0.6004

It will be observed that the mileage covered by these vehicles is very low being from $\frac{1}{3}$ to $\frac{1}{2}$ of their mileage capacity, and in consequence the cost per mile is high. Garage expense, drivers' wages, estimated depreciation (figured at 20 per cent) and similar fixed charges and distributed over too short a mileage to show marked economy. Nevertheless, Mr. Mackay states:

Two 5-ton electrics in street cleaning department effect a daily saving \$24 sprinkling and flushing during summer months. The sprinklers are operated in day and night shifts, of 9 hours

sprinkling by day and 8 hours flushing by night at a saving of \$24 per day of 17 hours over horse-drawn machinery. During winter months the tanks are removed and replaced by boxes which will hold 6 cubic yards of refuse.

Calgary has 1,300,000 square yards of pavement, covering 54 miles of paved streets. The full equipment for keeping this clean consists of four horse flushers, four rotary brooms, two squeegees, five horse sprinkling carts and two 5-ton electric trucks. In a test the two trucks used by the street cleaning department averaged 38 miles each per day of 9 hours sprinkling and 17 miles each per night of 8 hours flushing. The work cost \$1.30 per truck for energy during the 17 hours.

I might say that in addition to the two 5-ton trucks operated by the street cleaning department, we have a 1-ton truck used by the street railway department as a tower and for general construction work. Also a 1-ton truck and a 3-ton electric truck used by the stores department, for delivering materials for different departments, such as sewer department, public works and for handling stores material generally.

One 3-ton truck is used by the waterworks department. When this truck is used for moving water pipe, a trailer is attached and loads consisting of six lengths of steel water pipe, 20 to 24 feet long, 24 inches in diameter and weighing about 6 tons, having been hauled on this truck satisfactorily and with exceptionally good results, making economical transportation of this class of material. No hills of any size were encountered in these hauls, but for the greater part the haul was over ordinary dirt roads.

A 5-ton truck with an extra battery on the rear end of same over the back wheels, is used by the sanitary department, for hauling garbage. Three trailers are hauled, each trailer having an area of 445 cubic feet. There is a rope network laid around the inside of these trailers. The garbage is drawn by one-horse carts to centralization stations where the trailers are left and are loaded as the carts bring in the garbage, and are picked up by the electric truck at certain times each day. When the trailers reach the incinerator the traveling crane picks up the rope network and dumps the load into the pit. This truck takes the place of six teams.

The electric light department, having a 1-ton truck which is on the road an average of 18 hours a day, hauling material for construction work for line gangs, underground and sub-station construction. We also have a light steel tower which is placed on the truck and is used for trimming inverted magnetite lamps, on brackets, on street railway poles and standards. It is also used for patrolling certain circuits of arc lamps. We have a trailer we use with this truck for hauling poles. We have hauled on the 3-ton trucks, sixteen 35-foot poles, with 12-inch butt and 8-inch top, at a load. We have also loaded as many as eight 45-foot or 50-foot poles at a load. These poles were hauled over rough roads and up hills in all conditions of weather. One hill on this haul was 1,000 feet long and had a grade of 9 per cent, and just the ordinary dirt road which is almost impassable in wet weather. Still the electric truck was able to deliver its load.

The report of the Electric Vehicle Commission of England mentions an installation of 30 electric "watering vans" in a continental city not mentioned by name. The report states that "In the city referred to, each electric watering van waters about 49,000 square yards of road surface per day of 8 hours, as against 30,000 yards, the best average of horse-drawn truck. The saving stated to result from employing electrics in place of horse-drawn vans for this purpose by the municipality mentioned is about \$400 per electric truck per year.

In the matter of refuse collection tests have been made in several American cities to determine whether house to house collection of ashes, garbage and rubbish, as well as collection of sweepings at street intersections where same is usually deposited, can be more economically performed by mechanically propelled vehicles than by horses and carts. While it is unquestioned that for this service the battery electric is more economical than the gasoline machine neither one has yet proved its advantages over the horse and cart, so far as the authors of this paper have been able to learn.

The interest on investment, amortization and other fixed charges appears to be too high to justify the use of motor vehicles for the limited mileage possible in this

service, the restricted hours of operation, and the idle loading periods.

The *Commercial Vehicle* in its issue of August 14, 1914, gives details of the operation and cost of house to house refuse collection of a motor truck compared with horse trucks. The performance was personally observed by the investigator and the figures were taken from the records of the New York street cleaning department. The figures are as follows and show that the horse cart cost is lower than motor truck cost:

GASOLINE TRUCK.		HORSE CART.	
Gasoline	\$ 2.415	Feed, oats	\$ 0.407
Oil	0.746	Feed, hay	0.198
Depr. at 20 per cent....	2.777	Straw	0.027
Interest at 6 per cent...	0.833	Hostlers and stablemen.	0.382
Repairs, labor and materials, tires, grease and miscellaneous ...	4.068	Shoeing at \$1.60 per mo.	0.053
Garage rent	0.300	Veterinary	0.019
Driver's pay per day....	2.560	Depr. 6½ years, life at cost of \$285.00.....	0.122
4 helpers at \$2.00.....	8.00	Interest on horse at 6 per cent.....	0.048
	\$21.699	Wagon depr. 6½ years life, cost \$123.00.....	0.053
		Int. on cart at 6 per cent	0.02
		Harness depr. \$23.00 per set, life 2 years.....	0.032
		Int. on harness at 6 per cent	0.004
		Stable rent	0.300
		Wagon repairs and repainting	0.091
		Driver per day.....	2.560
			\$4.317

Gas car carried to dump 24 tons per day.
Cost per ton \$0.92.
Same service could be obtained from horse-drawn vehicles for \$0.799 per ton.

Upon withdrawing the motor truck from house to house service and placing it in transfer service with a crew of three helpers instead of four, made the total daily truck cost \$19.69. It has been found that the work covers 54 miles per day, hauling a total of 26.6 tons or \$1.03 per ton. The cost of transporting an equal tonnage for the same routes by horse and cart is \$1.56, an increase of more than 50 per cent over the motor truck cost.

These opinions are concurred with by the English report quoted as follows:

It should be obvious that in replacing horse-drawn vans and carts with motor vehicles, no matter whether they be petrol, steam or electric, the latter will show the best results where the refuse destructor is at a distance from the area of collection, the saving, of course, being in the high speed at which the motor vehicle can traverse this distance, and its greater carrying capacity. It is quite possible, on this account, that, in some towns, the best economy might be obtainable by a combination of ordinary horse-drawn vehicles for the districts in proximity to the destructor, with the use of electric vans for the districts further away. Possibly in the latter districts, also, the local collection could be best done by horse vehicles conveying the material to a central depot from whence it would be transported to the refuse destructor by large electric vehicles. An arrangement of this latter sort has been in successful operation in a large continental city for some time. The horse carts are provided with removable box bodies, so that when the cart arrives at the depot, the body is lifted off it by an electric crane, and placed upon the flat platform of a large electric vehicle, which when it has received its full complement of these full boxes, proceeds on its journey to the destructor. In the meanwhile empty box bodies are placed upon the tumbrils which once more proceed upon their rounds of collection.

In opposition to this view however the same report states:

Electric vehicles have been employed to a considerable extent on the Continent for refuse collection. The largest installation is in Paris, where the municipality possesses a fleet of 100 electric refuse collecting vehicles. Each has a capacity of a little over 15 cubic yards to the ton, makes the total load of the full vehicle not less than 5 tons. The vehicles perform their work during

the night hours, each covering about 25 miles nightly, with an energy consumption per vehicle mile of from 1.5 to 1.7 units. This system of collection was adopted as the result of a very careful trial made by the civic authorities which showed that considerable economy would be obtainable by the use of electric vehicles.

It is satisfactory to be able to record that, as the result of a trial of electric vehicles for refuse collection, the Urban District Council of Barnes has placed an order for four vans. The following information is expected from an instructive report submitted to the Council by its surveyor, G. Bruce Tomes:

It was found that one electric van would do the same work per week as that now done by sixteen horses and carts employed on refuse collection.

The cost of the type of electric van decided upon, complete with battery and electrically driven tipping gear, is \$4,725. The gear takes from 10 to 15 seconds to tip, and the speed of the van on the level is about 10 miles per hour, with a total mileage capacity upon one charge of 40 to 45. The capacity of the van is $4\frac{1}{2}$ cubic yards, which compares with the $2\frac{1}{4}$ yards of the present cart.

As a result of careful tests, Mr. Tomes found that the cost of operation came out at \$4.74 per van per day, which figure covered interest upon cost of vehicle, as well as its share of the charging equipment, repayment of loan on both of these items, wages, electricity, tires, maintenance of battery and chassis, insurance, lubricants and sundries.

The comparable figure for a horse and cart is \$2.75 per day. Basing his estimate upon the figures obtained by the trial of the electric vehicles, Mr. Tomes reported to his council that the replacing of the existing horses and carts by four electric vans would, notwithstanding a capital expenditure of \$20,000 on the vans and charging plant, result in a saving of at least \$2,000 per annum.

A similar trial made by the surveyor of the Heston and Isleworth Urban District Council resulted in the council placing an order for an electric dust van. The trial was specially interesting from the fact that experiments were made with three types of automobiles (namely: electric, steam, and gas) in order to determine the one best suited for this work. The electric van's safe load was 2.68 tons; it had a motor tipping body. The Garrett steam wagon had a capacity of 3 tons, and the Thornycroft gas wagon could carry 3.2 tons. It was found that any one of the three motor wagons could do the same work as previously done by four of the council's horses, but in point of saving in cost over horse haulage, the electric vehicle showed a saving of \$355, the steam wagon \$330, and the gas wagon only \$189 per annum. The report of the works committee to the council concludes by stating: "After careful consideration of the whole matter, the committee have come to the conclusion that an electrically propelled vehicle would be the best and most suitable for the purposes of house refuse collection." It is interesting to note that the purchase costs of the three types of vehicles were: Electric, \$4,200; steam, \$3,085, and gas, \$4,075; the estimated annual costs of working, including capital charges, being given as \$1,665, \$1,690, \$2,020, respectively. While the results in working cost for the steam wagon are a near approach to those of the electric, the surveyor notes that the "driver of the electric vehicle does not need any mechanical knowledge, an ordinary intelligent carter being quite able to perform the duties of driver"; while, in regard to the steam wagon, he remarks: "As is well known, a good driver is not always obtainable, and can only be discovered by the experience gained by the cost of repairs."

In December of last year some interesting trials were made of the use of electric vehicles for the collection of house refuse in Birmingham. The trials are dealt with in an excellent report presented to his committee by Mr. Jackson, the superintendent of the refuse disposal department, wherein he sums up the results in the following paragraph:

The three tests confirmed my opinion that electric vehicles have established themselves sufficiently to justify municipalities giving their support, perhaps, at present in a somewhat limited degree, to their development.

As a result the Birmingham corporation have placed an order for two electric refuse collection vans.

Dover is another place where electric vehicles are about to be used for the collection of house refuse, the corporation having, as the result of a trial of an Edison vehicle of 2 tons capacity, decided to order six such vehicles. Each will take the place of three carts of sixteen horses. A considerable annual saving is anticipated by the change in system.

In none of these cases are we informed of the existing local conditions and since no two municipalities have identical conditions a careful study and analysis should

be made to determine; first, the requirements of the service to be performed and second, the design of vehicles best suited to perform this service.

Prominent phases of the problem to be investigated and analyzed include:

Method of final disposal.

Traffic conditions and the limitations on design effected thereby.

Living conditions and effect of characteristics of inhabitants on motor vehicle design.

Effect of variation in weather conditions.

Seasonal variations in quantities of different classes of refuse.

Type of street pavements and variations in grades.

Functions required of the equipment:

(a) Refuse collection and transportation.

(b) Cleaning streets.

(c) Snow work (plowing, sweeping or carting).

An investigation along these lines in one of the districts in New York resulted in the design of a tractor trailer system, now being installed in service, by which house to house collection and transportation to point of disposal will be performed by day and various street cleaning operations at night. Thus the tractors will be operated on two shifts with different types of trailers and the saving over present methods will be substantial. While the conditions in the district in question and in other districts to which the system may later be extended led to the adoption of gas-electric tractors, it is highly probable that in many municipalities the storage battery electric would prove to be the solution, especially with a battery interchange system.

As comparing the relative economy of electric and gasoline operation on transfer work, the following data has been obtained from the New York street cleaning department on a 5-ton electric tractor and a 5-ton gasoline tractor, and estimates of operating costs of both machines have been made, based on this information:

5-TON ELECTRIC TRACTOR, AND 5-TON GASOLINE TRACTOR,
DEPARTMENT OF STREET CLEANING, CITY
OF NEW YORK.

The electric operates from stable at Flushing and Kent avenues, Brooklyn to Utica avenue, and Pacific street, Brooklyn. Round trip 7 miles, time 1 hour, 10 minutes. Pulls trailer carrying from 14,400 pounds to 18,800 pounds. Repairs to electric tractor since beginning of operation, none. Renewals only on tires. Trailer has had several minor repairs. Makes five trips per day. Load equals six to eight carts. Gasoline tractor from same stable, makes trip with same load in 1 hour, 5 minutes. Breaks down frequently. Below is an estimated comparison of operating figure.

ELECTRIC.		GASOLINE.	
Depr. at 10 per cent..	\$ 450.00	Depr. at 20 per cent...	\$ 960.00
Int. at 6 per cent.....	270.00	Int. at 6 per cent.....	288.00
Battery renewals and repairs	399.00	Maintenance	420.00
Mechanical parts upkeep	189.00	Tires	656.25
Tire renewals and repairs	336.00	Gasoline	471.00
Electricity at 0.05 per kw. hour	543.00	Oil and grease	131.25
Oil, water, etc.....	40.00	Total cost per year..	\$2,926.50
		Total mileage annually	10,500.0
		Cost per ton mile	\$ 0.0743

Total cost per year..\$2,227.00

Total mileage annually

ally

Cost per ton mile.....\$ 0.0565

A saving of approximately 40 per cent per ton mile.

POLICE PATROL.

The City of New York has in service one electric patron wagon and a number of gasoline patrol wagons. The police department, through E. V. O'Daniel, fourth

deputy commissioner, furnished the following figures and comments.

COST OF OPERATING ELECTRIC PATROL WAGON NO. 18.

Year	1913	1914	1915—1st half	Totals
Batteries	\$325.00	\$128.10	\$155.45	\$608.55
Repairs	126.06	465.03	43.38	634.47
Oil and grease.....	4.00	0.20	4.60	8.80
Sundries	1.33	7.17	6.94	15.44
Tires	119.70	40.09	.....	159.79
Mileage	11,136	11,742	6,667	29,545
Cost of current.....			6c per kilowatt-hour.	
			Total $\frac{3}{25}$ to $\frac{4}{25}$	\$36.42.
			Distance covered in this period, 1,223 miles.	

The average cost per mile is \$0.0871. This is on the assumption that the electrical cost per mile was standard at \$0.0298.

In 1914 the car was completely overhauled. During the whole period, the repair items have been larger than would be the case with a car of more modern construction. This particular car has been in use about eight years.

The batteries are charged at the 23rd precinct, where our electric current rate is 6 cents per kilowatt hour. Although saving could be effected by having the batteries charged at a station where the rate is lower, we cannot arrange to do this well on account of taking the car away from the district which it covers.

Amount of current used earns a 5 cent rate. The average cost per mile will therefore be \$0.0822.

These figures are taken from operation costs in the seventh and eighth years of service of this car.

On the gasoline machines Commissioner O'Daniel furnishes the following figures with the information that these figures represent an average, based upon the data for three cars of the same type. One of the cars had a general over-hauling during the year, so that the repair item represents what the normal yearly cost would be.

Cost of operation of gasoline motor patrol wagons, based upon cost figures for three cars, for 1 year, from June 30, 1914 to June 30, 1915.

3,049 Gallons gasoline	\$ 367.84
154 Gallons oils	34.32
178 Lbs, grease	18.49
18 Casings	527.40
11 Tubes, inner	68.81
Operation	\$1,016.86
Sundries	57.89
Repairs	312.64
	\$ 370.53
Mileage	14,984
Cost per mile	\$ 0.0923

Age of cars, 2 years

Comparison, gasoline car.....\$0.0923 per mile

Comparison, electric car.....0.0822

Saving of electric.....0.01 per mile, or 11 per cent

The City of Boston has an electric patrol wagon, which is attached to division 4 covering approximately 1 square mile, embracing the main hotel and theatre districts, Chinatown, the Turkish and Greek districts, and the most turbulent section of the South End, also Boston Common, the main shopping district, and the South Station.

Traffic from 7:00 A. M. to 12:00 midnight is very congested, and any considerable speed between these hours is impossible. From midnight to 8:00 A. M., the vehicle does all wagon and ambulance work for Division 2 (area not stated) as well as that of Division 4.

A typical week's performance from July 19 to 25 inclusive shows 103 calls, 119 prisoners to station, 7 injured to hospital. Daily miles from 1.73 to 17.76, a total of 63 miles for the week. Cost figures of operation are not available.

The City of Rochester has two electric patrols on which, however, no data has been obtainable.

HOSPITAL AMBULANCE.

Most of the New York Hospitals operate motor ambulances and the following figures of some of these installations are given herewith:

OPERATING COST OF SIX ELECTRIC AMBULANCES, NEW YORK HOSPITAL, 1914.	OPERATING COST OF THREE GASOLINE AMBULANCES, IN ANOTHER METROPOLITAN HOSPITAL, 1914.
Electricity	\$ 715.40
Lubrication	42.68
Labor, mechanical and percentage of engineer	642.00
Mechanical repairs, including battery renewals	3,760.89
Insurance	3,207.97
Tire repairs, renewals and supplies	984.00
Garage supplies	314.20
	\$9,667.14
Cost per ambulance....	\$1,611.94
Saving of electric 20 per cent in service almost identical.	\$6,162.72
	\$2,081.36

In connection with the above it is only fair to state that two or three of the electric ambulances are 5 or 6 years old, Dr. Thomas A. Howell, Superintendent of the New York Hospital, informed the authors that the cost of operation during 1914 was unusually high due to numerous battery renewals. His cost per ambulance during 1913 was only \$1,385.00 and he expects 1915 to be even lower. The gas cars for the other hospital have been in service for them only about 2 years. The Superintendent of the latter institution depreciates his equipment at the rate of $33\frac{1}{3}$ per cent per annum. He fully expects the gas equipment to be ready to scrap at the end of the third year.

The service of the electric is absolutely reliable. Their speed is all that is required and their saving over any other motive power is so marked that their desirability in city use cannot be questioned.

COMPARISON OF ANNUAL ELECTRIC AND GASOLINE AMBULANCE OPERATION COST IN BELLEVUE AND ALLIED HOSPITALS, CITY OF NEW YORK.

Electrics	Gasoline
Harlem hospital One \$712.99	Gouverneur Two \$542.99 each
	Bellevue Four \$525.84 each
	Fordham Two \$1666.38 each

Average cost

Electric \$557.00, Gasoline \$1383.00, Saving by electric 60 per cent

In connection with the tabulation given above the reason for the very great difference in cost of operation at these hospitals and the cost experienced by the New York and the other Manhattan Hospital is explainable by the fact that the City of New York carries its own insurance and no charge is made therefore. The other Institutions also make certain charges for labor in connection with mechanical repairs not included by the above.

The current costs on the electric are estimated. No record of the actual consumption having been kept. An allowance of \$144.00 per annum per ambulance is made which at the rate earned by these institutions equals 4,800.0 kilowatt-hours. Allowing only $2\frac{1}{2}$ miles per kilowatt-hour this would permit of 13,000 miles annually per ambulance.

BOARD OF EDUCATION.

In the City of New York two 5-ton gasoline trucks have been used for merchandise transportation and distribution of school supplies for a number of years and the purchase of electrics is under consideration. The

following figures are therefore given showing actual cost of the gasoline trucks during the past year and the estimated cost of electric trucks in the same service:

COST OF OPERATING DURING 1914.

TWO GASOLINE, 5-TON TRUCKS IN SERVICE OF BOARD OF EDUCATION, CITY OF NEW YORK.	PROBABLE COST OF OPERATING TWO 5-TON ELECTRIC TRUCKS IN SAME SERVICE.
Investment\$ 7,500.00	Investment\$ 8,200.00
Amortization at 10 per cent. 750.00	Depr. at 10 per cent. 820.00
Interest at 6 per cent 450.00	Interest at 6 per cent 492.00
Storage at \$23.75 each 570.00	Storage 570.00
Gasoline, 6,209 gallons, at 15c..... 931.04	Current at 0.05..... 848.54
Oil, 200 gals. at 34c.. 128.58	Lubrication, water, etc. 50.00
Tires 978.00	Battery repairs and renewals 567.33
Repairs 900.00	Tires 594.78
	Repairs 296.73
\$12,207.62	\$12,439.38
Total mileage 18,301	18,301
Average daily mileage 32.77	32.77
Cost per car mile... \$0.2572	\$0.2316
Saving possible \$0.0256 or about 10 per cent per car mile.	

DEPARTMENT OF WATER SUPPLY.

A number of gasoline machines and one electric are in use by this department, which has furnished the following figures on actual operating cost during the first and second quarters of the present year and the probable cost of electric machines for the same periods and the same service has been tabulated for comparison. In connection with the figures furnished by the department attention is called particularly to the fact that no allowance has been made for depreciation, interest on investment and in some cases for tires, mechanical repairs and renewals. Therefore, in making the corresponding tabulations for electrics corresponding items have been omitted which makes the actual comparisons not truly representative. In every case, but one, the electric shows a saving, these savings would appear larger if all proper items were included in both tabulations. It should also be noted that the average daily mileage is low in some cases, from $\frac{1}{4}$ to $\frac{1}{3}$ of the possible mileage of an electric, and with the possible exception of the vehicles used for emergency service electrics would unquestionably be more economical and reliable.

DEPARTMENT OF WATER SUPPLY, 1915.

1½-TON GASOLINE—KATONAH		PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.		
	1st quarter	2nd quarter		
Salary	\$ 78.75	\$127.50	Salary	\$206.25
Gasoline	18.92	20.18	Current at 0.5 per kw. hour	55.20
Lubri. oil	1.00		Lubrication, water, etc.	7.50
Misc. supplies and expenses	0.33		Tire repair and renewal	34.51
Labor, mech. repairs	22.50		Battery repair and renewal	35.00
Material, mech. repairs	25.24			
O. M. O.....	2.75	144.46		
Equipment	3.23	2.20		
Tires	91.76			
	\$244.48	\$294.34		\$338.46
Total miles ..	762.0	1703.0		2465.0
Average daily mileage		16.4		
Cost per mile.	\$0.32	\$0.173		
Average cost per mile, six mos.		\$0.2465		\$0.1373
1½-TON GASOLINE-RIDGEWOOD-SUPPLIES.		PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.		
	1st quarter	2nd quarter		
Salary	\$164.90	\$160.00	Salary	\$324.90
Gasoline	31.98	25.29	Lubrication, water, etc.	11.92
			Current	90.61

Lubr. oil 2.38	3.68
Misc. supplies and expenses	
Labor mech. repairs	
Material, mech. repairs	
O. M. O.....	
Equipment ...	
Tires	

	\$199.26	\$188.97	\$427.43
Total miles...	2,088	1886.5	3974.5
Average daily mileage		26.5	26.5
Cost per mile. \$0.095		\$0.100	
Average cost per mile, six months		\$0.0975	\$0.107

1½-TON GASOLINE DISTRIBUTION, QUEENS.

	1st quarter	2nd quarter	
Salary .....\$300.00	\$300.00		
Gasoline 44.76	40.14		
Lubr. oil 7.64	7.10		
Misc. supplies and repairs. 0.65	4.63		
Labor mech. repairs			
Material mech. repairs			
O. M. O..... 9.52			
Equipment .. 1.50	7.00		
Tires			

	\$364.07	\$358.87	\$717.90
Total miles...	1,925	2,675	4600.0
Average daily mileage		30.7	30.7
Cost per mile \$0.189		\$0.134	
Average cost per mile six months		\$0.157	\$0.156

1½-TON GASOLINE, SUPPLIES RICHMOND.

	1st quarter	2nd quarter	
Salary .....\$300.00	\$300.00		
Gasoline 3.78	31.74		
Lubr. oil..... 0.55	3.58		
Misc. supplies and expenses 0.90	0.02		
Labor, mech. repairs 83.25			
O. M. O..... 4.19	25.13		
Equipment .. 4.19	0.68		
Tires			

	\$476.02	\$361.15	\$668.52
Total miles...	111	1641.8	1752.8
Average daily mileage		11.7	
Cost per mile \$4.288		\$0.219	
Average cost per mile, six months		\$0.47	\$0.381

1½-TON GASOLINE EMERGENCY, BROOKLYN.

	1st quarter	2nd quarter	
Salary .....\$900.00	\$900.00		
Gasoline 14.10	15.51		
Lubr. oil..... 0.95	1.87		
Misc. supplies and expenses			
Labor mech. repairs 2.81	14.63		
Material, mach. repairs 0.08			
O. M. O.....		9.05	
Equipment ..			
Tires			
	\$917.94	\$941.79	\$1836.76

PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.

Salary .....\$600.00	
Current 105.10	
Lubrication, water, etc 12.80	

PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.

Salary .....\$600.00	
Lubrication, water, etc 5.25	
Current 39.96	
Repairs, moving parts. 23.31	

PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.

Salary .....\$1800.00	
Current 32.73	
Oil, water, etc..... 4.03	

Total miles..	680	755.9	1435.9
Cost per mile	\$1.350	\$1.246	
Average cost per mile, six months	1.298		\$1.278

1½-TON GASOLINE, EMERGENCY CONEY ISLAND.			PROBABLE COST OF 1½-TON ELECTRIC FOR SAME PERIOD.	
	1st quarter	2nd quarter	Salary	\$1060.00
Salary	\$527.50	\$532.50	Current	109.86
Gasoline	54.59	40.59	Oil, water, etc.....	14.51
Lubr. oil	1.20	4.46	Battery repairs and renewals	72.58
Misc. supplies and expenses		2.12	Tire repairs and renewals	58.07
Labor mech. repairs	88.99	130.50		
Material mech. repairs	4.88	64.50		
O. M. O.....		7.55		
Equipment ..				
Tires		20.96		
	\$669.16	\$803.18		\$1314.82
Total miles..	2827	2012		4839
Cost per mile	\$0.237	\$0.399		
Average cost per mile, six months	0.289			\$27.1

The following memorandum furnished by the acting chief of supplies of the same department gives some data on the electric truck in the department, which was purchased second-hand and put into service after being overhauled by the manufacturer:

IN RE 2-TON ELECTRIC TRUCK.

The truck was delivered to the department on May 26, 1915;		
From that date to Sept. 15th.....	113 days	
Sundays and holidays included	19 days	
At manufacturers for additional equipment..	2 "	
" " repairs.....	11 "	32 "
Leaving working days.....	81 "	
The average daily miles traveled in July...	22.7	
The average daily miles traveled in Aug...	23.1	
The average daily miles traveled in Sept...	29.9	
Taking the lowest average 22.7 applied to the four days in May and the days worked in June for which we have no record, we get a total mileage of.....	1877.1	
or an average daily mileage of.....	23.1	
The wages of the automobile engineer to date	\$256.40	
Cost of current to Sept. 1st was.....	\$29.35	
Estimated cost of current Sept. 1st to 15th	5.00	34.35
		\$290.75
or per day.....		2.56
Comparing the cost of operation of the truck with the cost of the hired team, truck and driver at \$6.00 per diem, we get		
Chauffeur's wages.....	\$3.00 per diem	
Current	0.35	
		\$3.35

with a mileage of 23.1 miles.

The mileage of a horse truck is about 15 miles per day. Therefore the truck would cost, for the same mileage as our electric truck, \$9.00. Deducting from this the \$3.35 per diem of the truck we have left \$5.65 which would give a larger sum than is necessary for depreciation and still show a saving for which I think we ought to be commended.

In Chicago the department of gas and electricity, through A. C. King, deputy commissioner, furnishes the following figures on an electric truck in service in that department and an estimate of probable cost of gasoline truck in similar service is submitted for comparison, showing a saving about 25 per cent by the electric:

COST OF OPERATING 2-TON ELECTRIC TRUCK, DEPT. OF GAS & ELECTRICITY, CHICAGO, 15 MOS.

Investment	\$3500.00
Depr. at 10 per cent..	350.00
Interest at 6 per cent..	210.00
Battery up keep.....	187.50
Tire up keep.....	61.00
Mech. parts up keep...	17.50
Current	131.25
Chauffeur's wages....	1200.00
	\$2157.25
Total miles	7110
Average miles per day	18.6
Days in operation.....	387
Cost per day.....	\$ 5.57
Cost per mile.....	0.3003

PROBABLE COST OF SIMILAR SERVICE WITH 2-TON GAS CAR.

Interest	\$3200.00
Depr. at 20 per cent...	640.00
Interest at 6 per cent..	192.00
Mechanical upkeep ...	177.75
Tire upkeep	248.85
Gasoline	177.75
Oil and grease.....	53.32
Chauffeur's wages	1200.00
	\$2689.67
Total miles	7110
Average miles per day..	18.6
Days in operation.....	387
Cost per day.....	7.49
Cost per mile.....	0.3782

BUREAU OF HIGHWAYS.

The following figures on operating cost of gasoline tractors has been supplied by the New York Department of Public Works, covering 4 months of service of these machines, which are of one of the best makes and most economical of operation with a tabulation of the estimate operating cost of the electric tractors for the same service.

COST OF OPERATING FIVE TRACTORS, MUNICIPAL ASPHALT PLANT, CITY OF NEW YORK, March, April, May, June, 1915.

Depr. at 20 per cent..	\$1926.13
Interest at 6 per cent..	676.29
Fuels	681.51
Material, departmental repairs	123.30
Open market ordered repairs	257.90
Storage and labor.....	742.91
Chauffeur's wages....	2470.71
	\$6878.75
Total mileage	15737
Average daily mileage per tractor	32.16
Cost per day per tractor	\$13.62
Cost per car mile per tractor	0.437

PROBABLE COST OF OPERATING FIVE ELECTRIC TRACTORS IN SIMILAR SERVICE. Four Months.

Depr. at 10 per cent..	\$1101.72
Interest at 6 per cent..	665.45
Current at 0.05.....	888.84
Repairs, moving parts.	261.20
Storage and labor.....	742.91
Chauffeur's wages....	2470.71

It is interesting to note that repair expenses have been incurred already on these practically new machines also that their daily mileage is well within the electric zone. It may further be pointed out that these machines are used in repairing asphalt pavements in the Borough of Manhattan, that they operate over paved streets, that when weather conditions are unfavorable there are no street repairs and the tractors are not in service. Therefore they are operating under the most favorable conditions. This installation is one which is obviously best suited for electrics.

GOVERNMENT PRINTING OFFICE.

The figures below have been previously published and are doubtless familiar to the members of the Association, but are incorporated in this paper for the purpose of comparing them with estimated cost for similar service with gasoline machines:

Capacity	1000 lbs.	2000 lbs.	3000 lbs.	4000 lbs.	7000 lbs.
Interest and depreciation, less batteries and tires	\$244.50	\$306.30	\$391.40	\$422.94	\$470.84
Mechanical and electrical upkeep	67.54	84.15	101.70	110.96	121.42
Tire repairs and renewals	79.28	97.30	155.05	267.60	535.25
Battery repairs, cleaning and renewals	130.50	175.36	219.34	271.54	312.84

Current at 0.01 per kw. hr....	20.00	30.20	40.00	60.00	51.50
	\$541.82	\$693.31	\$907.49	\$1133.04	\$1491.85
On basis that with 1,000 lbs. vehicle will cover 3 miles to each kw. hr. 1 ton—2¼ miles per kw. hr.; 3,000 lbs., 2 miles; 4,000 lbs., 1½ miles; and 7,000 lbs., 1¼ miles. The cost per mile would be.....	6000 0.0903	6795 0.1020	8000 0.1134	9000 0.1298	6392 0.2334
COST FOR SIMILAR SERVICE. GASOLINE VEHICLES.					
	1000 lbs.	2000 lbs.	3000 lbs.	4000 lbs.	7000 lbs.
Interest and de- preciation	\$286.00	\$573.00	\$622.50	\$680.00	\$947.50
Mech. upkeep....	100.00	120.00	160.00	225.00	223.72
Tire repairs and renewals	120.00	180.00	280.00	315.00	319.60
Gasoline	100.00	120.00	160.00	225.00	223.72
Lubrication	30.00	45.00	60.00	67.50	63.92
	\$636.00	\$1038.00	\$1282.50	\$1512.50	\$1778.46
Miles per year... 6000	6000	6795.0	8000.0	9000.0	6392.0
Cost per mile....	0.1005	0.1527	0.1603	0.168	0.2785

Illustrating the fact that if gas cars were used they would cost from 11 per cent to 40 per cent more.

The authors cannot too strongly emphasize the fact that every electric vehicle installation in municipal service, which has come to their attention, is giving economical and satisfactory service and in most instances these vehicles are showing greater economy than others of any other motive power. This economy is due in a large measure to the long life with low depreciation, freedom from mechanical repairs, reliability, simplicity of operation and reduced tire cost. Notwithstanding the obvious advantages of the electric, the authors wish to strongly emphasize the necessity for a careful investigation and analysis of the service requirements of municipal departments contemplating the installation of mechanically propelled vehicles, whereby errors in judgment made only too frequently in the past, may be obviated in the future.

Getting Economy on Short Hauls

Motor trucks can be made to work cheaper than horses on one-mile hauls. Short hauls have always been the bane of successful truck operation, according to many users, but the greater truck efficiency as compared to horses may be secured irrespective of the length of haul.

The belief that motor trucks are only efficient on long hauls is wrong. Although you often hear that trucks are not as efficient as horses expect on long hauls, this is not the fault of the trucks, but of the manner in which they are applied. The length of haul has nothing to do with it. In speaking with motor truck salesmen you often find them loud in their claims for economy of trucks when the haul is long, but they begin to hedge when you start to talk of one-mile runs. This is wrong.

Time is the all-important essential of modern business. It is especially so in all forms of vehicular transportation. The motor truck is a time saver. Its existence today among the movers of the world's goods is due to the fact that it is a time-saver as compared with the horse. It will carry the same or a greater amount of goods much more quickly than horses require to haul the load. The saving of time is the most important of the assets of the motor truck, although economical and sanitary considerations also are of prime moment.

The motor truck is a time saver—when moving. Unfortunately many hundreds of trucks are not moving for as great a proportion of their possible working

time as they should, and for this reason do not save as much time as they should and are not as economical as they might be. The great proportion of idle truck time is not spent generally in the delivery of the goods carried but in their loading and also in their unloading when they are hauled intact from point to point, rather than delivered at various stops along the way.

Idle truck loading and unloading time is responsible in almost all cases for truck inefficiency and for the fact that in some instances the cost per unit delivered by the truck is greater than with horses.

Hundreds of thousands of dollars are being wasted annually all over the country because motor truck owners have not installed modern time-saving devices in connection with their motor equipment. This condition does not only apply to certain business, but unfortunately is general, many instances being found in practically every class of work in which trucks are used. As more goods are delivered, piece by piece or package by package, than are hauled intact from the point of loading to the destination, the loading time is of the most importance in the great majority of cases.

In nine cases out of ten dissatisfied users of motor trucks can trace the reasons for their dissatisfaction to the methods of loading, whereas those loudest in praise of the motor truck as compared to the horse will be found among those who banished horse-pace methods of loading when they banished the horse. It is impossible to operate motor trucks successfully on horse-pace methods. One of the most flagrant of horse-pace abuses to which motor trucks are subjected is to load them in the same manner as the horse wagons which they replaced were loaded. Whereas an idle loading time of one or two hours per day did not materially diminish the work done by a horse during the day, and in some cases was necessary in order to give the beast a rest, the same percentage of idle time in the operation of a motor vehicle plays an important part in the latter's cost of operation per unit of work done because of the truck's greater cost of maintenance and its unrealized ground-covering ability.

Cases of improper operation, however, are becoming less and less numerous because of the greater dissemination of motor truck operating knowledge and linking up with this the realization of the fact that time is money and that a motor truck only makes money when it is saving time. This result is being accomplished in many various ways, according to the different conditions under which the trucks are working. The means used to accomplish the end desired may be roughly divided into three general classes, as follows:

1. Mechanical loading and unloading devices on the truck or at the points of loading and unloading.
2. The use of demountable or nest bodies, or bodies with side doors.
3. The use of trailers of the four-wheeled, semi-trailer or two-wheeled types.

The methods to be pursued in each case in order to keep the truck moving naturally vary a great deal, due to the kind of goods hauled and the peculiar conditions under which each different installation has to work. No matter what these restricting conditions are, they are bound to be one or more places where some sort of mechanical time-saving devices, either on the truck or on the loading platform, may be used to increase the truck's moving time.

Reports of the Sections

Presented at the Sixth Annual E. V. A. Convention. (Continued from November)

SAN FRANCISCO SECTION

AT the June 25 meeting of the San Francisco section it was considered advisable to have a general reorganization and re-election of officers. In due process this was accomplished and the section is now trying hard to promote vigorous interest and a large increase in membership.

Aside from the reorganization, and placing the local section on a definite basis, nothing very much has been accomplished. However, in the light of present local activity in electric vehicle work, they are hopeful for an active time in the near future. Both of the large central stations in this city are taking active and practical steps to promote the use of electric vehicles by their patrons. One of the central stations has even established a complete battery service system in the hopes that interest might be stimulated. The other central station promises to electrify, as soon as practicable, all of its trucks and pleasure cars that can be so operated.

The above facts, together with the successful launching of the first "fleet" of electric trucks in this city and the likely assurance that a second fleet will be launched in the near future, give us great confidence as to the outcome of the electric vehicle interests under the rather extreme topographical conditions found in this city.

LOS ANGELES SECTION

In making this report it is an added pleasure in the success the Los Angeles section has enjoyed during the past year, both in membership and results attained.

The section has at the present time sixty-four members and a representative from every electric vehicle agent in Los Angeles, as well as representatives from the tire houses and accessory companies.

All meetings during the incoming year will be held at the Jonathan Club as in the past, and no doubt one of the causes of the great success of the Los Angeles section has been the feeling of good fellowship that prevails during meetings; and in holding the meetings at this club, which is one of the finest in Los Angeles, the slightly added cost for the dinner and entertainment is more than compensated by the social environments of the surroundings.

The section makes especial mention of the good work accomplished by the garage committee, J. O. Case, chairman. This committee has worked hard and faithfully to bring about a closer co-operation between the central stations and garage owners, and in establishing charging stations in the vicinity of Los Angeles. The electric car owner is now able to travel over the fine boulevards of Southern California to any of the suburban towns within a radius of 80 miles and they are now assured they can receive a full charge for their car or have it boosted at a high rate. This committee has during the past year arranged with the different central stations charging facilities at the following towns in and near Los Angeles: Redondo, Ocean Park, Venice, San Pedro, Pomona, Ontario, Redlands, Riverside, San Bernardino and Santa Ana.

And it is here that the committee received their fine co-operation from the four large central stations operating in Southern California. In some of these towns there is not enough business to support an exclusive electric garage, but the central stations which have sub-stations in these towns have installed a motor generator set for the charging of transient tourists. This one feature alone has given the Los Angeles section a prestige to the electric car owners, which is thoroughly appreciated.

The membership committee, H. J. Kister, chairman, is also working hard and faithfully in rounding up eligible members.

All committees have worked hard on the duties allotted to them. The membership as a whole are doing their share to make the work easier and more efficient for their officers.

PITTSBURGH SECTION

Monthly meetings have been held regularly since February, which have been very well attended by both members and guests.

In March "The Pittsburgh Order of Jovians," the greatest order of boosters in Pittsburgh for everything electrical, invited the section to a luncheon at the Fort Pitt Hotel. The day was set aside as "Electric Vehicle Day" and after a very excellent lunch, which was fully enjoyed by everyone present, especially the E. V. A. members, the secretary read a paper on the "Electric Vehicle; Its Development and Advantages." The object of the E. V. A. was explained to the Jovians and their co-operation invited.

At the March meeting E. P. Chalfant gave a very interesting talk on the electric vehicle industry and its position in the field and followed this with a paper on "Co-operation Between the Electric Dealer and the Central Station." H. Harris, general contract agent of the Duquesne Light Company, who was present at this meeting, replied for the central station and advised the local dealers that the local central station was willing to co-operate with them in any manner, which they might suggest, for the benefit of the industry in Pittsburgh.

In April a strong effort was put forth to have a real celebration. The Dutch Room of the Fort Pitt was engaged and the moving picture film "Selling Electric Vehicles" was secured and F. B. Fink, of the General Vehicle Company, accepted an invitation to come out and give us a talk as the star attraction of the evening. Letters of invitation were sent out to over 300 users of gasoline trucks and horses in the Pittsburgh district to have dinner with us and a large attendance was expected. Those who attended spent a very enjoyable evening.

At the June meeting, which was held at Klee-mans Inn, East Liberty, L. C. Meyers, the local Waverly agent, read a paper from H. H. Rice, president of the Waverly Company, who was unable to be present, on "The Present Opportunity in the Electric Field." The paper dealt extensively with the great advertising and educational value of the electric vehicle in sociability runs, and the wider and more general use of the electric by a systematic and continuous

campaign for the instruction and enlightenment of the public.

The meeting being an annual one, an election of officers was held and the present officers were unanimously elected for the coming year.

This being vacation time the members decided to take a two months' rest and the next meeting will be held on September 15, at which time an effort will be made to have a large representation at the annual convention.

NEW YORK SECTION

Section formed and petition accepted by the board of directors, July 15, 1914.

Membership	Active	Associate	Auxiliary	Press	Total
September 30, 1914....	17	172	3	18	210
September 30, 1915....	17	198	4	17	236

Although the New York section was organized during July, 1914, active work was not begun until November. Meetings were held monthly from that time and papers of timely interest and importance presented. In a number of cases the papers were illustrated with stereopticon views or charts and a feature of one meeting was a demonstration of hard rubber battery jar construction by representatives of the India Rubber Company. The thanks of the section membership is due in large measure to the papers committee, which has labored painstakingly during the year to provide papers dealing with subjects of the moment and at the same time maintaining the policy that whatever was to be presented and discussed must be absolutely in accord with the aims and purposes of the association. The data presented must be accurate and useful to the membership, with a note of cheerfulness and optimism revealing itself throughout. A proper start was made at the first meeting, when a paper entitled "Practical Ideals in Electric Vehicle Promotion" was enthusiastically received and discussed. The section has endeavored to use the "Practical Ideal" method throughout its activities during the year.

Meetings of the executive committee have been held monthly and special committees appointed to investigate and report upon matters arising from time to time. The committee work was done under the direction of chairmen especially qualified for the work, in the following branches: papers and publicity, reception, nominating, membership, garage and charging stations, performance and operating records, traffic, insurance, legislation, statistics, employment registration.

Each of these committees co-operated with the national committee looking after its particular subject in addition to following up the local work.

The garage committee supervised the garage situation and has a total of six official garage and charging station signs displayed in the several parts of Greater New York. It is expected that the coming year will see the placing of a considerably greater number.

The traffic committee has been very active attending hearings for city departments, business men's associations and serving on joint technical committees for the solution of this complicated problem which, through the proposal of a restrictive ordinance, threatened to interfere seriously with the motor vehicle industry.

The employment registration committee was appointed during the year with the purpose of making up a register of the men employed in electric vehicle work in garages and charging stations. It is felt that

by the creation of a central point for those seeking employment or those desiring employes that helpful assistance might be given. Although business conditions did not produce a great call, nevertheless a number of men were introduced to positions through the effort.

The subject of membership was brought up at each meeting of the section and other means employed to boost the number of members. The total, while only showing a net gain for the year of 26 members, it nevertheless represents the receipt of a considerably greater number of applications. It may be explained that there was a certain amount of "dead wood" on the roster at the beginning of the year consisting of those no longer connected with the industry or who had expressed their desire to resign some time previous. Considerable effort was spent in trying to keep all members in line if possible, but it was necessary to accept 19 resignations. From this it will be seen that the actual number of applications received during the year was 45, giving the real working membership of 236.

A decided effort will be made during the next association year to bring all the members closely together for section work, as it is felt that the best interests of the section may be served better in that manner than by confining section activities to the central stations and one or two willing manufacturers' representatives.

DETROIT SECTION

The Detroit section did not hold meetings during June, July and August. The meeting held September 1 at the Board of Commerce Building had a small attendance, due in part to several of the members being out of town.

CLEVELAND SECTION

In December, 1914, the few members whose principal business was located in Cleveland met in the club rooms of the Electrical League of Cleveland to organize a local section in connection with the league. Hayden Eames was elected chairman, J. P. Lyons, vice-chairman, and R. S. Dunning, secretary. Various committees were appointed by the chairman and activities began.

In January, 1915, the section planned to hold an exhibition in connection with the Cleveland automobile show, and secured the rooms of the Gould Storage Battery Company for this purpose. The Gould Company very kindly furnished a buffet lunch to the members of the Electrical League and the new business committee of the Ohio Electric Light Association who attended the meeting. Cards were given out to all members of the two organizations and also to the visitors at the automobile show. About 200 people came to the entertainment. The program consisted of the buffet luncheon followed by motion pictures and slides furnished by the Electric Vehicle Association and some of the local members.

Meetings of the section were held regularly for about a year, and were discontinued during the summer months. Several new members were added to the section from time to time, until the membership reached a total of about thirty-five. In May, 1915, the section made arrangements for President John F. Gilchrist to talk to the members of the Electrical League at one of the regular Thursday luncheons. About 200 members of the league listened to the very able talk given by Mr. Gilchrist. After that time, activities were suspended because of the approach of warm

weather, and have not as yet been taken up because of the necessity of taking care of the local details in connection with the convention.

An effort will be made to bring about more direct results and closer co-operation and understanding between the public and members of the industry of Cleveland. The section has the warm and enthusiastic support of the Electrical League of Cleveland, and feels that much can be done through this affiliation.

TORONTO (CANADA) SECTION

The local branch has been inactive during the past year on account of the general dislocation of business brought about by the European war. Notwithstanding this condition, there appears in the future, prospect for a general revival of business that will reflect itself upon the transportation end of most industries. The manufacturers have apparently become discouraged, with a few minor exceptions, and have, therefore, temporarily at least, discontinued their aggressive efforts to introduce the use of the electric, where horse-drawn and gasoline vehicles are now used. The general scarcity of money for capital investments has caused all of the large department stores, breweries, express companies, and even the central stations, to put off as long as possible the purchase of additional transportation equipment.

The companies in this country are placed under the additional disadvantage of having to pay a duty of 42½ per cent on any vehicles purchased in the States and imported into this country. A portion of this duty is chargeable to a special war tax placed upon imported articles since the war commenced.

It appears that the most fertile field for the electric is in the light delivery business, where thousands of wagons are utilized at the present time. To break into this field, it will be necessary to introduce a low-priced car, similar to the "Ward special," which is now meeting with a considerable amount of success. Needless to say, aggressive efforts are required on the part of the manufacturer, and substantial guarantees must be made, before a skeptical public will fall in line and purchase what we all consider to be the best for the purpose required.

DENVER SECTION

The Denver section was organized September 10, 1914, and all of the officers were elected at that time. Regular monthly meetings have been held on the third Tuesday of each month and the average attendance, consisting of members and guests, has been twenty-one.

Some of the accomplishments have been the promoting of a harmonious spirit among electric car salesmen. Prior to the organization of the Denver section considerable enmity was manifested among said dealers due to the keen competition and their various methods of salesmanship.

The section also conducted an Electric Vehicle Salon on the main sales floor of the Denver Gas & Electric Light Company building, at which exhibition seven passenger and two commercial cars were sold, and the stimulus there given to the vehicle resulted in many other sales closely following the show.

It has also been able to raise the rates charged to the car owner for the garage service on the car and the garage has in turn increased its service to the car owner.

The programs at the section meetings have been along the line of education as concerns the local field, dealing with the garaging and upkeep of cars, research into late and improved methods of garaging and garaging apparatus, as well as the accomplishments of the electric car in other fields.

The Denver branch discontinued its August and September meetings, due to the vacation period, and resumed its active efforts early in October.

ST. LOUIS SECTION

The question of establishing a St. Louis section of the association was first seriously considered in April, 1914. The National Association took the matter up with the present secretary to secure at least the minimum of fifteen members so that a local section could be authorized by them, and this was readily secured among the local electric vehicle fraternity.

The petition submitted was accepted by the board of directors on August 25, 1914, and on September 3 the first meeting of the section was held. At this meeting the following officers were elected: C. E. Michel, chairman; F. E. Stevens, vice-chairman; H. B. Marshall, secretary.

Mr. Michel felt that he could probably do more work for the Association if not in office than he could as chairman and at the next meeting, held November 25, his resignation was accepted and M. B. Strauss was elected to take his place.

Monthly meetings have been held of the section since that time and the organization has gradually been improved and strengthened so that we feel considerable good can be accomplished in the electric vehicle field in St. Louis during the coming year.

Under the direction of the membership committee, of which R. W. Leach is chairman, our membership has increased so that at the present time there are 28 members in good standing. While the greater number of those particularly interested in the electric vehicle in St. Louis are now members of the St. Louis section, still we hope to increase this membership materially during the coming year.

A. E. Archer, as chairman of the advertising committee, has prepared plans for a large co-operative advertising campaign which will be participated in by the local car dealers, central stations, battery companies and accessory houses. It is planned to get together an appropriation from \$3,000 to \$4,000 to be expended in the local newspapers, this advertising to be run over the name of the Electric Vehicle Association of America, with the names of each company contributing to the fund. We expect to have a complete report made on this appropriation and the matter will come up for final decision at the next meeting of the association.

Mr. Archer reports that we have not secured as much publicity for the electric vehicle in the newspapers as we should have, this being partly due to the fact that we have not had anything of particular interest to offer the newspapers, and Mr. Archer has suggested it would be advisable for the National Association to have a special department at headquarters whose duty it would be to send out news stories to all of the large newspapers throughout the country, or if preferred, this could be sent to the local advertising committee at each point where sections have been formed and these committees could arrange to have this information inserted in the newspapers.

F. E. Stevens, as chairman of the garage committee, has made an exhaustive study of garage conditions as they exist in St. Louis at the present time and he has made a number of recommendations to our section with the thought of having garage practice standardized. The recommendations of his committee have been adopted by practically all of the garages operating in St. Louis.

C. E. Michel was recently appointed to prepare a map of the city which would clearly indicate at just what points charging current would be available. As soon as this map has been completed it will be furnished to all owners of electric cars in St. Louis with the compliments of the local section.

It has been the endeavor at recent meetings to have a paper presented by a representative of companies manufacturing apparatus used in the electric vehicle industry. Some very interesting papers have been presented at these meetings by J. F. Lincoln, of the Lincoln Electric Works, Cleveland, Ohio; and J. L. Force, of the Shepard-Valentine Company, representing the Electric Products Company, Cleveland, Ohio.

PORTLAND SECTION

On March 15 twelve persons gathered for lunch at the Hazelwood and formed a temporary organization which continued meeting for lunch weekly until the visit of Mr. Marshall in June. Several times the question of joining the association came up, but enough members could not be secured to make the section successful.

On April 27 at the weekly lunch ten men agreed to join the association and made out signed applications to be sent in as soon as the necessary fifteen were secured. Three more signatures were obtained later, making thirteen in all. The matter dragged here until June.

On June 14 Mr. Marshall arrived in Portland and during that and the following day enough applications were secured to make a section. Sixteen signatures were on the petition that was sent in to the New York office. Since then two more have been forwarded, making eighteen in all.

On June 21 at the Imperial Hotel the section was formally organized and officers elected to serve until the beginning of the fiscal year in October. At this meeting it was also decided to meet for lunch at the Benson Hotel each week with the Portland Electrical Club and starting in the fall to hold in addition a monthly meeting in the evening. After two more luncheons the club gave up its meetings for the summer and no meetings have been held since.

The only public result of the section so far was Electric Vehicle Day at the club in May.

The two central stations in Portland are very much interested in the success of the section and all anticipate a successful year.

Electric Endures for Many Years

While not generally known, it is a fact that electric trucks built in 1899 are still in successful operation. The old Riker and Columbia machines seem to defy age, and while they are so needlessly heavy that they are great consumers of current, with modern batteries they give the mileage necessary on their routes, and as they have paid for themselves long ago, their owners hesitate to scrap them for newer machines.

The General Vehicle built several hundred machines in 1901-1904, and a large percentage of these old warriors are still working, some of them side by side with modern General Vehicle trucks. The express companies, the brewers and one or two department stores operate the bulk of the old Electrics still in service. In some cases, such machines have been practically rebuilt, but the original frames, axles and steering mechanisms are still on the job. In Rochester and Indianapolis there are General Vehicle and Columbia machines in the service of the Adams Express Company which have been in the hardest possible kind of work for over twelve years. The Lansden company also has many veterans in express service.

Some of the General Vehicle trucks purchased between 1901 and 1905 have had checkered careers. Instances have been shown where a brewer bought two such trucks, became disgusted with them and sold them for the proverbial song. They went to a contractor, who had better success with them, though no doubt his vocabulary was considerably increased before the end of the first year. In the meantime a competitor of this brewer had gotten the knack of successful operation of electric trucks and began buying up the bargains made possible by dissatisfied users. The first brewer, who sold the two trucks to the contractor, is reported to have bought them back at a considerable premium, and he used them for seven years or until the machines were nine years old, when they were taken as part payment for new trucks.

Another brewer got along very well with his 1903 models until he came to getting spare parts for them. This was in 1909, and he found that the manufacturer had since simplified and standardized his design and could only supply 1903 parts at a steep price, as they had to be specially made up, almost by hand. The brewer was a shrewd buyer, and this is how he solved the problem. He bought two second-hand electrics of the same make and capacity, paying \$150 and \$225 respectively, and took from them the parts he needed for those in service. This scheme was so practicable that when two of the grocer's trucks had not more spare parts he sacrificed one of his own three to keep the other two running, and when they needed further help he bought some new standardized machines. Two other brewers studied battery problems in 1904, and after getting their own machines on a paying basis, bought up all the five-ton electrics they could find at low prices. One of them still operates 19 old ones and two new ones, the other 14 of the oldest brewery type now in service.

There is an electric truck in Norfolk, Va., which was run for a year in London, brought back to New York, where the original body was taken off and a new one put on. The body which was used in London was put on another chassis and sent to another section of the country.

A famous New York jewelry house sold all horses seven years ago as a result of what their 1902 electrics accomplished in the way of economy. Today 17 of their 19 electrics are over ten years old, and notwithstanding the fact that their one-ton panel wagons weigh 1,600 pounds more than the one-ton wagon built by the same manufacturer today, they have no trouble getting all the mileage they need at a cost very satisfactory to them. They have added modern batteries and go from Broadway to Oyster Bay or Irvington-on-the-Hudson on a regular charge of the battery.

Electric Vehicle Association Developments

Sectional Development Work, Reports of Committees and New Announcements

This department will hereafter contain all activities of the Electric Vehicle Association of America, in all of its sections, as reported by A. Jackson Marshall, national secretary.

Realizing the valuable co-operative development work which the association is doing, the publishers of **ELECTRIC VEHICLES** offer this exclusive section to association members and all electric vehicle interests in order that they may keep closely in touch with association matters.

A COUNCIL MEETING of the association was held November 12, which was attended by Messrs.

Walter H. Johnson, president; E. S. Mansfield, vice-president; John F. Gilchrist, R. L. Lloyd, D. C. Fennner, W. P. Kennedy, A. Jackson Marshall, secretary, and by invitation, W. C. Andrews.

The secretary reported the status of membership, presenting 41 resignations, which were accepted, and 55 applications, which were approved, bringing the membership of the association on November 12 to 1104.

MEMBERSHIP BY SECTIONS

New England section	119
Chicago section	147
Philadelphia section	80
Washington section	60
Cincinnati section	20
San Francisco section	24
Los Angeles section	63
Pittsburgh section	34
New York section	230
Detroit section	49
Cleveland section	28
Toronto section	17
Denver section	17
St. Louis section	30
Kansas City section	15
Portland section	18
Rochester section	16
Members at Large—	
At home	107
Abroad	29

The secretary presented a petition for the Rochester section which was unanimously accepted by the council. With the Rochester section, the association now has 17 sections.

COMMITTEES

President Johnson presented his committee appointments, which were approved by the council.

The secretary made recommendation that the parcel post committee be expanded to embrace all government applications of electric vehicles, and in the extended discussion which ensued it was regularly motioned and passed that this committee be known in the future as the federal and municipal transportation committee, so that its work would embrace municipal as well as federal applications. President Johnson is still considering appointments to this committee.

Manufacturers' co-operation committee:—The secretary offered the suggestion that a manufacturers' co-operation committee be appointed, the thought being that this committee, composed of representative vehicle manufacturers, could suggest ways and means that the association could employ which would bring about closer relations with the manufacturers and enable the association to generally increase its effectiveness. After a prolonged discussion, it was regularly moved and seconded that the president be empowered to appoint such a committee, the consensus of opinion being that such a com-

mittee would be a very valuable addition to the association.

Traffic committee:—It was considered advisable to enlarge the scope of the traffic committee, combining the traffic and good roads committee, and it was regularly moved and seconded that hereafter the name of this committee would be street traffic and good roads committee.

NATIONAL ELECTRIC LIGHT ASSOCIATION RELATIONS

President Johnson read a communication from E. W. Lloyd, president of the National Electric Light Association, with further reference to Mr. Lloyd's plea for closer co-operation between the N. E. L. A. and the E. V. A. A., as made in the form of an address before the Cleveland convention. President Johnson requested the privilege of appointing a committee to investigate ways and means of closer relationship of the National Electric Light Association, and even to consider a possible amalgamation if it were thought desirable, the committee to make its report at a subsequent meeting of the council for action. After an extended discussion, in which the desirability of a closer relationship with the National Electric Light Association was voiced, a motion was regularly made and carried, authorizing President Johnson to appoint a committee on closer relationship with the N. E. L. A. and the president appointed the following committee: Walter H. Johnson, chairman; Frank W. Smith, and P. D. Wagoner.

The secretary was notified to notify Mr. Smith and Mr. Wagoner of appointments so that a meeting of the committee could be arranged at an early date, and in the meantime, the secretaries of the two associations would confer.

RESIGNATION OF GEORGE H. KELLY

The resignation of George H. Kelly as a director of the association was presented, as Mr. Kelly has severed his connections with the electric vehicle industry and would not find it possible to continue as a director. The selection of a new director was left with President Johnson.

ADVERTISING BOOKLET

Secretary Marshall presented a prospectus of a booklet to contain a comprehensive treatise on the electric vehicle which it was thought could be developed for resale to central stations for distribution by them to prospective purchasers of electric vehicles. The proposition in general apparently met with favor and the secretary was authorized to take up this matter further with Frank W. Smith, chairman of the publicity and advertising committee, in an effort to devise ways and means of preparing the booklet with minimum expense to the association.

APPOINTMENT OF SECRETARY

President Johnson presented to the council his appointment of A. Jackson Marshall as secretary of the

association during the present administration. The appointment was regularly approved.

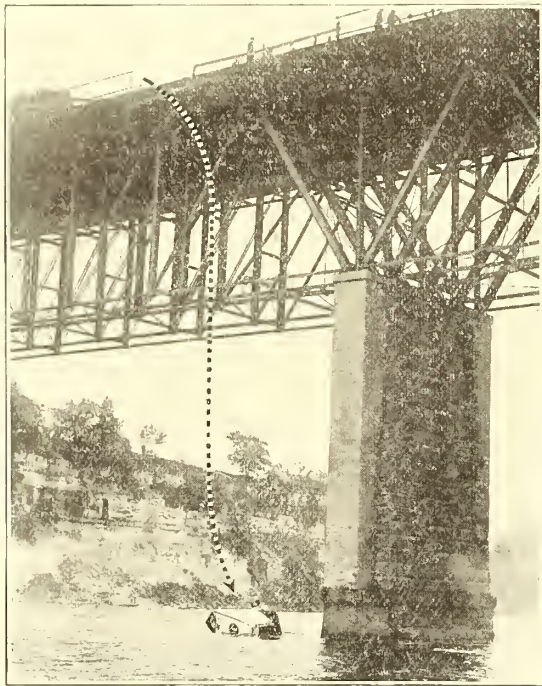
The council meeting adjourned at 5:15 P. M.

WASHINGTON SECTION

The executive committee of the Washington section held a meeting on November 4, in the offices of the Potomac Electric Power Company, Chairman R. B. Emerson presiding.

After a discussion as to the November meeting, and Eva's November party, it was decided to hold the party on Thursday evening, November 11, the date of the technical meeting, and postpone the technical meeting until December.

The chairman of the program committee was authorized to spend \$5 for each technical meeting for the pur-



The Edison Batteries After Being Submerged, Operated Efficiently.

pose of procuring a moving picture film, or some other feature, the matter of selection to be left to his judgment.

The chairman of the publicity committee, Mr. Orme, stated that he had no report to make on advertising. Discussion followed as to probable cost of getting other electrical pages in the newspapers. It was proposed to get out a special page each month.

SAN FRANCISCO SECTION

On November 10 the San Francisco section held a meeting of the section, Chairman C. W. Hutton presiding.

Two of the association releases were read by the secretary, "The Electric Taxicab" and "Electrics Prove Good Hill-Climbers in Department Store Service."

Much interest and discussion of an educational nature took place, the constant potential system charging being discussed; also the announcement of the new type of Edison battery.

A committee consisting of the secretary, A. Morbio, F. Wakeman and Mr. Halloran was appointed to see how many electric vehicles could be secured to take part in an electrical parade, December 4, 1915, during electrical prosperity week.

CHICAGO SECTION

On October 5, at 7 P. M. the annual dinner and election of officers of the Chicago section was held in the

East Room of Hotel La Salle, Chairman W. J. McDowell presiding.

After an admirable seven-course dinner, the meeting was called to order and oral reports were received from each of the committee chairmen.

Then the report of the nominating committee was called for, it being as follows:

George B. Foster, Commonwealth Edison Company, for chairman.

W. F. Bauer, Edison Storage Battery Company, for vice-chairman.

F. E. McCall, secretary, also of the Commonwealth Edison Company.

EXECUTIVE COMMITTEE

D. M. Simpson, papers and program committee.

Gail Reed, garage and rates committee.

A. J. Brechtel, traffic regulation committee.

W. C. McNitt, membership committee.

It was moved and seconded that the report of the nominating committee be accepted. This motion was put by the chairman and carried. After the above officers and executive committee were duly elected, the meeting was turned over to Homer E. Niesz, who acted as toastmaster. Mr. Niesz after a short preamble called on W. B. Taylor, of Rockford, Ill., president of the Illinois Garage Owners' Association, who talked for considerable time on the garage situation in general and boosted for a departmental cost system.

The toastmaster called upon George B. Foster, who talked on the electric garage situation as seen by the Commonwealth Edison Company.

Mr. Niesz then spoke in commendation of the work of the officers of the Chicago section, and Chairman McDowell in particular, who, at the conclusion of Mr. Niesz's remarks, was presented with a token in the shape of a solid gold watch fob, made up in a design of the regular E. V. A. A. wheel emblem. After thanking the donors, Mr. McDowell stated that they could always count on his interest in the association, although he might not be quite as active in the future.

At the October 12 meeting, which was held in the Hotel Metropole, George B. Foster, the newly elected chairman, presided.

C. A. Street was the speaker of the day and talked on the commercial electric truck. At the conclusion of Mr. Street's remarks the discussion turned to the subject of battery service and became quite prolonged, the gist of this being upon the ability of the battery service company to protect its interests in case of theft, etc.

The October 21 meeting was held at the Hotel Metropole at 1:15 P. M.

George B. Foster, who presided, made a few remarks concerning the more important features brought out at the Cleveland convention, namely, details of the Detroit electric taxicabs, and the paper on industrial trucks. He also announced that Chicago had a good-sized delegation of twenty-nine at the convention, but was extremely sorry that more could not have been privileged to be in attendance also. The chairman then introduced E. J. Ross, Jr., of the Edison Storage Battery Company, who was to talk on the latest developments in which Edison Batteries are concerned. Mr. Ross said that their A type of cell was introduced in the winter of 1909 and that the type of construction practically remained constant up to the present time. He further stated that his company had investigated the constant potential charging and were now recommending the same under certain restrictions to the users of other batteries. He said that they were recommending 1 75/100 volts per cell in the battery line switch, whereupon no resist-

ance could be required. The starting current would be about two times normal and would become normal at the end of about 3½ hours. There are four advantages to be gained by this method—first, increased commercial watt hour efficiency; second, it tends to eliminate garage labor; third, in material reduction in the amount of gas given off; fourth, it tends to eliminate unnecessary over-charging.

He further stated that they started to develop a special cell for a submarine battery about three years ago. The result of this development is their G-type cell, which is so constructed that it enables them to get 50 in per cent more positive weights than in the regulation battery. They are not yet generally recommending the G-types, as they are not in a position to make them in any great quantity and besides they want to know more about it themselves.

Mr. Ross then went over the Detroit taxicab situation quite in detail.

The battery rental service proposition between the six companies in New York, the Ward Motor Vehicle Company and the Edison Storage Battery Company, was gone over by Mr. Ross. In this, the various companies in New York turned their light and power salesmen loose and set out to sell one hundred cars in October. The usual price of \$875 under the scheme was to include the first year's battery rental. Mr. Ross closed his remarks with a short resume of the doings of the Hartford Electric Light Company's battery service system. Mr. Ross was asked a number of questions, which he took care of in a very able manner. Mr. Ross was given a rising vote of thanks.

On October 26, George B. Foster, who also presided at the meeting, gave a short dissertation on battery service systems and told of where such systems were now in effect. He also said Baltimore, Md., was just starting such a form of service and mentioned the New York arrangements with the Edison Storage Battery and the Ward electric truck.

Gail Reed of the Walker Vehicle Company was then introduced and abstracted the paper: "Data on the Hartford Electric Light and Power Company's Experience with the Battery Service System" by W. M. Thayer, as presented before the Cleveland convention. At the finish of this paper he continued by reading a paper on the experience of the Walker Vehicle Company and the K. W. battery rental proposition. Considerable discussion followed.

At the November 2 section meeting, W. F. Bauer, scheduled to present an account of the workings of the standardization committee, unfortunately could not be present, R. Macrae was called on and read his Cleveland convention paper entitled: "The Function of the Electric Garage." He also digressed and called attention to the electric taxicabs in Detroit and their quite evident success, also made remarks about a paper on the "Industrial Trucks in the service of the Pennsylvania Railroad" and told of seeing such trucks in actual operation several days later on the docks at Detroit. Then followed a discussion on attainable garage load factors and methods of charging together with keeping down the maximum.

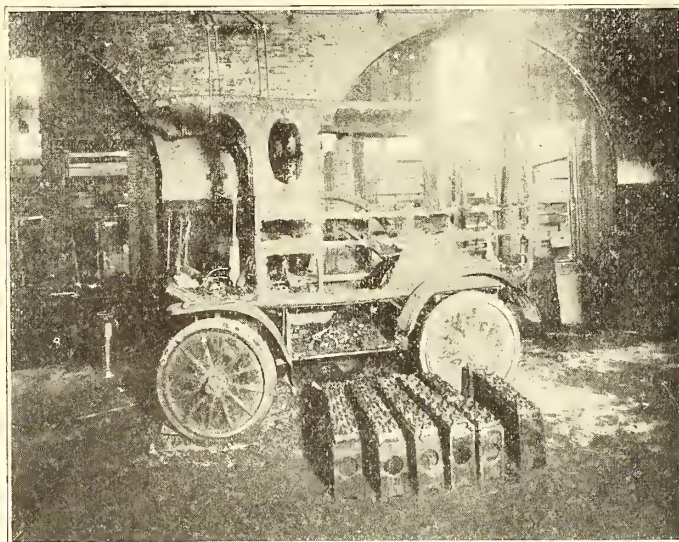
An executive committee meeting was held on November 5, George B. Foster, chairman, presiding. At this meeting, the various committee chairmen presented their plans for the coming year of the work they hoped to accomplish, and the affairs of the Chicago section in general discussed.

PITTSBURGH SECTION.

The Pittsburgh section held a meeting on October 29 at Kleman's Inn, East Liberty, Pa., W. A. Donkin, chairman, presiding.

The meeting was held to formulate plans for the coming year's work. It was decided to hold a transportation meeting, and to invite by personal solicitation, a representative of each large company in the Pittsburgh district using horses and trucks to this meeting and have the same addressed by a transportation expert.

Arrangements for this meeting were left in the hands of T. H. Schoepf of the Westinghouse Electric &



A Burned Electric Truck. Note the Good Condition of the Edison Batteries.

Manufacturing Company, chairman of the papers committee.

NEW ENGLAND SECTION.

The New England section held a meeting on October 13 in the Edison Building, L. D. Gibbs, presiding.

This being the annual meeting, a nominating committee was appointed to bring in a list of officers for the year. The committee reported the following:

J. T. Day, chairman; Albert Weatherby, vice-chairman; L. L. Edgar, treasurer; Charles H. Miles, secretary.

Executive Committee.

W. A. Blachford, R. B. Daggett, George H. Hudson, Fred M. Kimball, E. S. Mansfield, F. H. Smith, Fred J. Stone, C. A. White.

The secretary was instructed to cast one ballot and the above officers were declared elected.

ST. LOUIS SECTION.

On November 3, at the American Hotel Annex, the St. Louis section met, Chairman Frank E. Stevens, presiding.

After the meeting was called to order, a letter received from the convention bureau of St. Louis regarding bringing the next convention of the Association to St. Louis was read and a committee was appointed by the chairman to investigate the matter fully to see if we wished to give the convention bureau our cooperation toward endeavoring to bring the convention to St. Louis. This consists of Messrs. R. R. Doak, A. E. Archer, and M. B. Strauss.

There was a short talk on the subjects that were under discussion at the Cleveland convention, after which the meeting adjourned.

PHILADELPHIA SECTION.

A very interesting meeting was held in the Philadelphia section on October 26 in the library of the Philadelphia Electric Company, Chairman R. L. Lloyd presiding.

Chief Mechanician Walker of the Philadelphia fire department was present, and reported that following the success of the Philadelphia fire department with its electrically-propelled apparatus a large number of other cities were rapidly acquiring such apparatus.

The chief stated that in numerous tests between gasoline and electrically-propelled apparatus, the electric apparatus invariably out-distanced the gasoline propelled apparatus, from the time the alarm was struck until the arrival at the fire by one minute or more.

He also stated that on the recent demonstration held before the convention of fire chiefs in Philadelphia in October, the electrically-propelled fire engine, having a longer distance to go than any of the gasoline-propelled apparatus, was the first to arrive at the scene of the demonstration fire.

Chairman Lloyd presented a resume of the various committee reports and papers presented at the Cleveland convention.

In order to promote interest in an electric vehicle run, to be held during electrical prosperity week, the association, on motion made and approved, agreed to present a cup, to be donated by the committee in charge of the run, as a cost not to exceed \$25.

On motion, approved that the chairman appoint a committee to arrange the details of a sociability run. The chairman appointed:

A. W. Young, chairman; Rodney S. Pullen, H. H. Doering, R. W. Brouse, Joseph G. Coane and S. Woodson Reese.

The chairman also appointed the following committee to co-operate with the Philadelphia Electric Company to organize one or more truck parades in various sections of the city during electrical prosperity week:

A. H. Manwaring, chairman; E. L. Reynolds, F. E. Whitney, Frederick B. Fink and J. C. Bartlett.

The following officers were elected for the year 1915-16:

R. L. Lloyd, chairman; Ellen S. Hare, vice-chairman; H. H. Doering, secretary.

Executive Committee.

Walter H. Johnson, F. E. Whitney, R. L. Heberling, E. L. Reynolds, W. A. Manwaring.

After discussion, concerning the desirability of noon or evening meetings, it was, on motion: Resolved that the meetings for the forthcoming winter be held in the evening, commencing with the second Wednesday in November.

DENVER SECTION.

A meeting of the Denver section of the association was called for November 8 for the purpose of discussing plans for electrical prosperity week.

NEW YORK SECTION.

A meeting of the New York section was held November 10.

Charles A. Ward read his Cleveland convention paper, "Field for the Small Electric Delivery Vehicle," after which an interesting discussion took place on the operating costs of horse-drawn and electric vehicles.

New officers for the New York section were elected as follows:

D. C. Fenner, chairman; S. G. Thompson, vice-chairman; David F. Tobias, secretary.

Executive Committee.

C. A. Poyer, T. C. Martin, F. F. Sampson, Charles A. Ward, E. P. Chalfant, Nathaniel Platt, Frank W. Smith, Harvey Robinson and W. P. Kennedy.

D. C. Fenner then assumed the chair and made a few inaugural remarks. He asked for a vote of thanks for Mr. Ward's presentation, which was unanimously given. He then introduced John F. Delahant of the New York Edison Company, who gave an illustrated talk on the Ward-Edison durability run, New York to Cleveland.

ROCHESTER SECTION.

The organization of the Rochester section and especially the rapidity in which this development was effected is worthy of note and congratulations to those principally responsible.

Henry J. Schneider of Rochester attended the recent highly successful sixth annual convention of the association, held in Cleveland. Mr. Schneider was an electric vehicle enthusiast prior to attending the convention, but the practical accomplishments so definitely reflected at Cleveland caused Mr. Schneider to the more fully appreciate the value of organized effort to the manufacturers and other representatives and he felt that the organization of a Rochester section would be of very considerable sales assistance. Consequently, he intimated to Secretary Marshall that upon his return to Rochester he would endeavor to get together those that might be interested and organize a local section.

In less than two weeks after the close of the Cleveland convention, Mr. Schneider sent to the general office a petition signed by fifteen persons whose membership applications accompanied same, and at the council meeting on November 12, this application was unanimously accepted, and on Friday, November 19, Secretary Marshall visited Rochester, where on that evening a very enthusiastic meeting, which was attended by some twenty-five or thirty interested people, was held in the Powers Hotel, at which time the objects and accomplishments of the association were set forth by Secretary Marshall in considerable detail and it was quite apparent that the magnitude and scope of the Association's practical sales work was a revelation to most of those gentlemen attending and with a more complete understanding of the association's force. It was freely stated that the Rochester section would rapidly grow until it had sixty or more local members and if it were expanded to take in Western New York, it was possible to have one hundred and fifty or more members, and that the organization would undoubtedly accomplish a great deal of needed work.

It is likely that the Rochester section will expand and be known as the Western New York section, embracing the territory in that general vicinity, meetings to be held from time to time in the various cities included in the territory.

At the November 19 meeting, the following officers were elected:

Chairman, Henry J. Schneider, Philadelphia Storage Battery Co.; vice-chairman, L. M. Brown, Segar's electric station; secretary, W. S. Burch, Rochester Ry. & Light Co.

PUBLICITY.

The general office is continuing its policy of preparing and releasing articles treating with various phases of the electric vehicle industry several times each month and it is interesting to note that these articles are receiving splendid reception and reproduction by the most influential newspapers and magazines in this and many foreign countries.

Electric Truck "Prosperity"

The first practical gasoline automobile was built about 1886—the first real Electric truck 15 years later. Neither had much of a great demand success until 1909 or, say, 7 years ago. It takes time to introduce things so revolutionary.

The great bulk of the Electric trucks of the world have been built in the past *five* years. Each good Electric sold eventually sells two more, so production will increase rapidly once a certain distribution is reached.

Electric Truck "Prosperity" is here, already, for if you discount everything else, G. V. *reorders* alone would keep a big plant running. In addition there are thousands of business men who are being converted to the economic side of Electric trucking. Others are installing Electric trucks because this is in line with the entire electrification of their plant or store. Don't forget that the future of the Electric truck is limited only by the future of Electricity itself. The business man who claims that the Commercial Electric is "impractical", "no good", "needs a nurse" and so on, very frequently gets a short arm jolt when his competitor installs Electric Delivery.

G. V. Electrics have demonstrated over 10 years' life in hundreds of cases. They have covered as high as 21,000 miles each per year. They are efficient in hilly cities like Pittsburgh and Cincinnati. They are efficient in Winnipeg and Manila—two climatic extremes. Every so called weak point of the Electric has been given the lie in actual performance—*somewhere*.

Get the facts—you doubters—get the facts! *Specific adaptability* is all that is needed to place the Electric (the G. V. at least) absolutely at the head of efficient trucking. Let it be our pleasure to show you Why. Our new catalogue awaits your address.

General Vehicle Company, Inc.

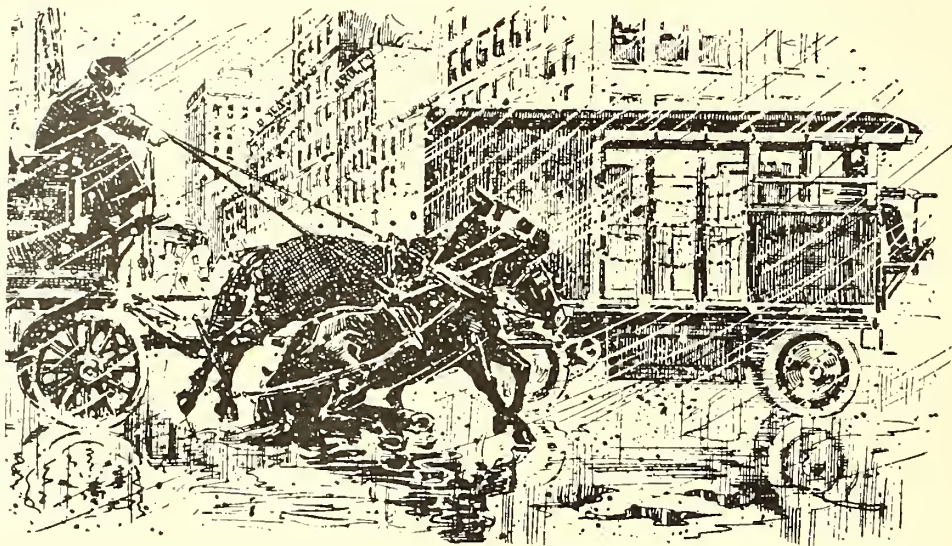


Long Island City, N.Y.



New York, Chicago, Boston, Philadelphia

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The Assurance of Service Walker Electric Vehicles

Neither grades nor extremes of weather prevent these cars from giving constant, satisfactory service.

Walker Trucks in service for twelve years prove that they have three times the life of gas cars—more than twice that of a horse.

The Walker **adaptability feature** and the Walker patented **balance drive** will prove of particular interest to you.

Let our engineers analyze your delivery requirements. You assume no obligation.

Walker Vehicle Company

Manufacturers of Chicago Electric Passenger Cars
and Walker Electric Trucks

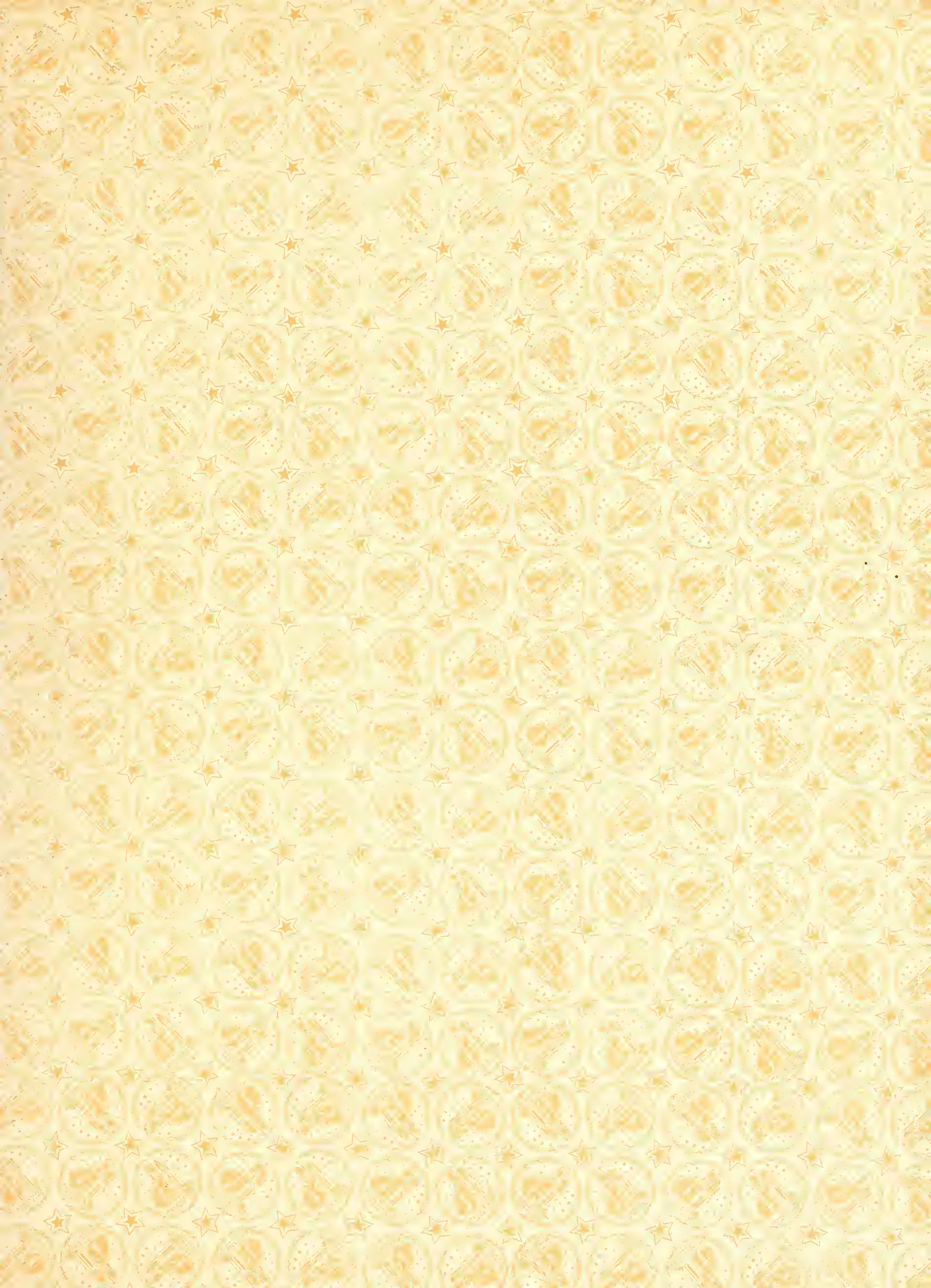
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